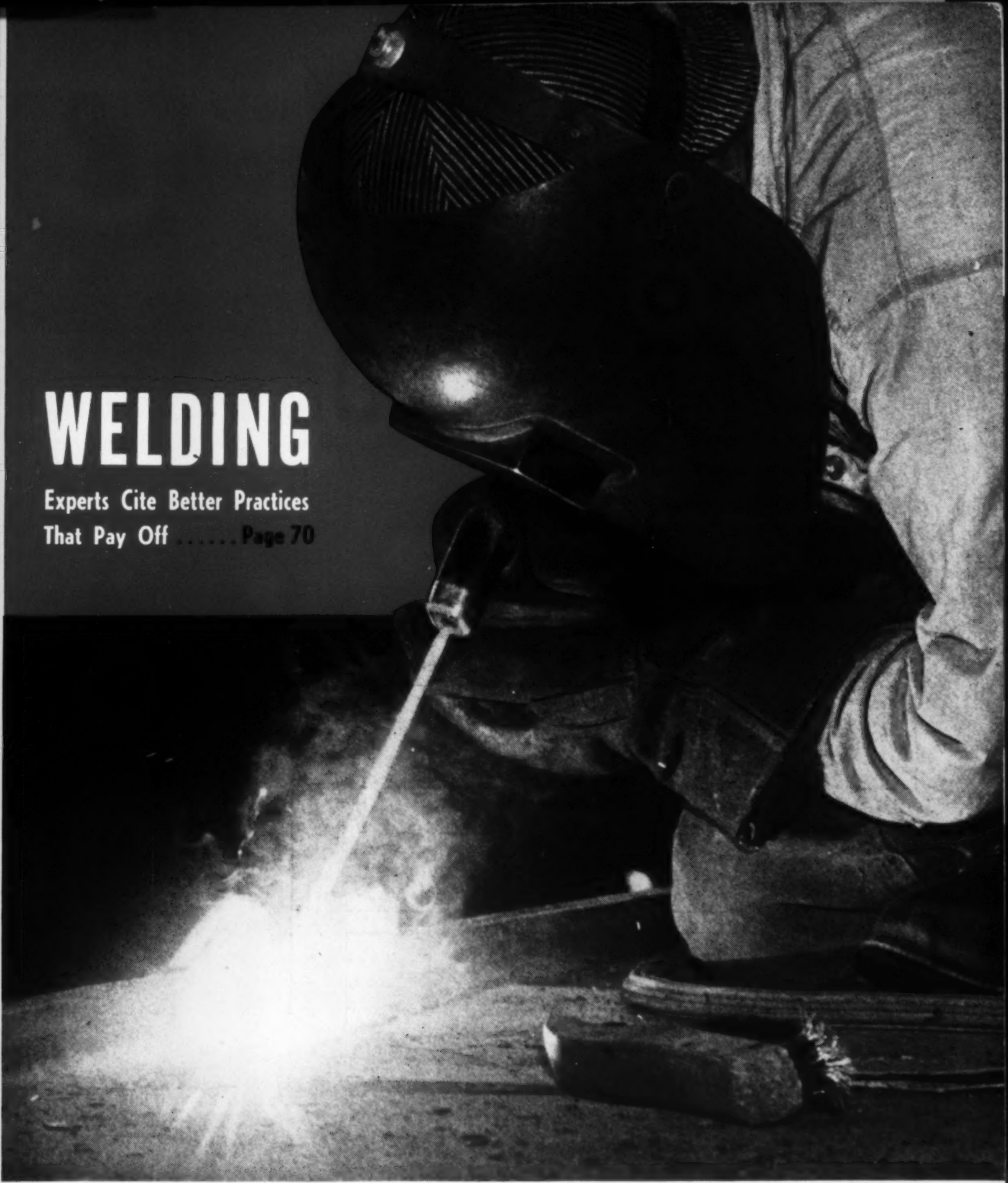
STEEL
The Metalworking Weekly
A PENTON PUBLICATION
OCTOBER 23, 1961



# WELDING

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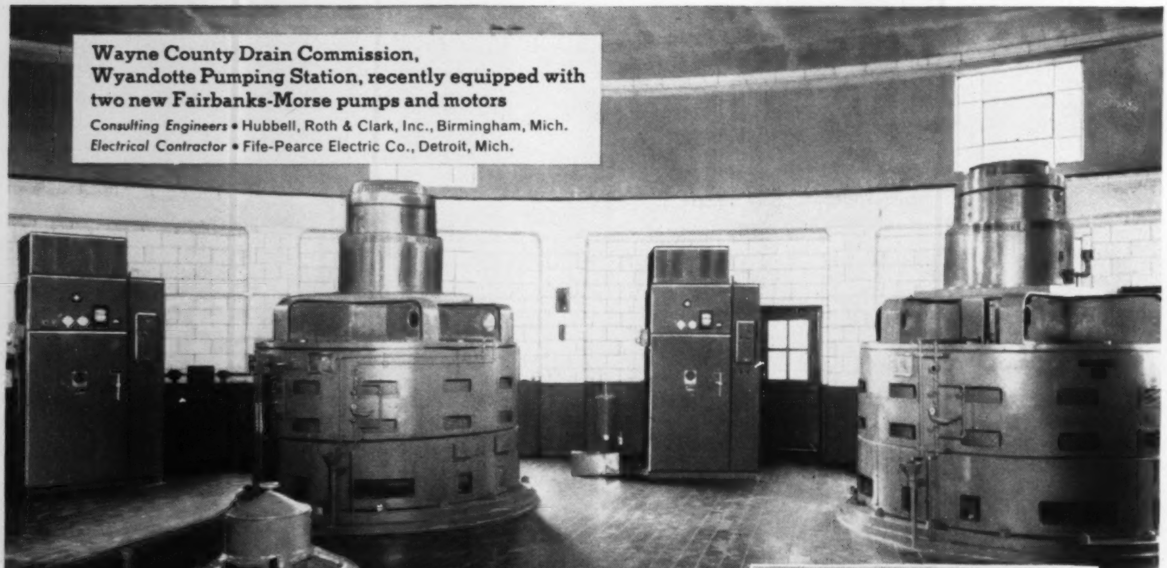


**Wayne County Drain Commission,**
**Wyandotte Pumping Station, recently equipped with two new Fairbanks-Morse pumps and motors**
*Consulting Engineers* • Hubbell, Roth & Clark, Inc., Birmingham, Mich.
*Electrical Contractor* • Fife-Pearce Electric Co., Detroit, Mich.

Certificate on File in Cleveland

# Certified Fault Protection WITHOUT FUSES!

## EC&M Fuseless Starters

## ELIMINATE FUSE PROBLEMS & COSTS

Now you can get full fault protection without the problems associated with fuses. EC&M's fuseless starters have certified interrupting capacities of 100,000 KVA at 2400 volts, 150,000 KVA at 4800 volts — an important consideration when starters were selected for the 1250-hp, 4800-volt starters at Wyandotte Pumping Station. This inherent fault protection is an EC&M "exclusive" — and is available with no first-cost premium.

EC&M starters are safe and easy to maintain. A three-way door interlock gives positive personnel protection, and an interlock is provided between the contactor and disconnect switch. Disconnect blades are visible in the open position when the door is open. No roll-out or draw-out needed for maintenance. All six contacts can be replaced without special tools in 10 minutes or so.

These cost-saving features make EC&M starters the logical choice for 2200-4800 volt motor drives.

**TYPICAL SAVINGS WITH EC&M STARTERS**

| | Fused Starter | EC&M Fuseless Starter |
|---|---|---|
| Cost of 1250-hp 4800-volt Starter | $xxx.xx | Same as Fused Starter |
| Spare Fuse Costs: Set of 3 Spare Fuses for 1250 hp | $470.00 | 0 |

**SAVE** *per starter, up to* **$500**
*(more on larger motors)*
*...with EC&M Fuseless Starters*

***Write* FOR DETAILS • Ask for Bulletin 8130**
*Square D Company, EC&M Division, 4500 Lee Road, Cleveland 28, Ohio*

**SQUARE D COMPANY**
EC&M DIVISION • CLEVELAND 28, OHIO
*wherever electricity is distributed and controlled*

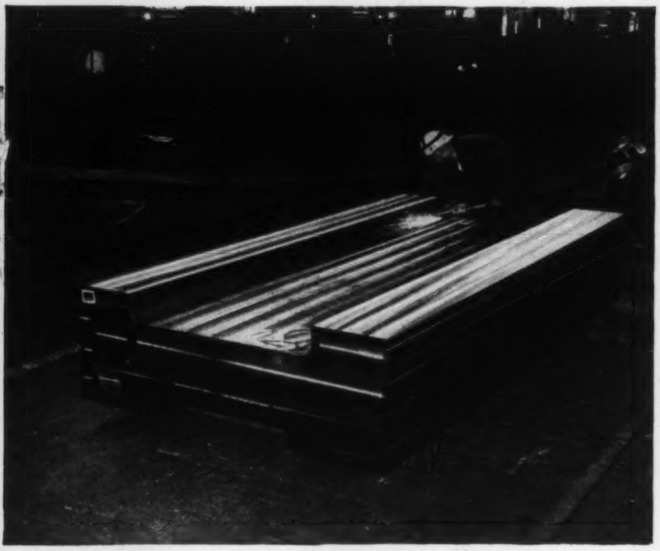
6520

# You name it...we'll forge it!

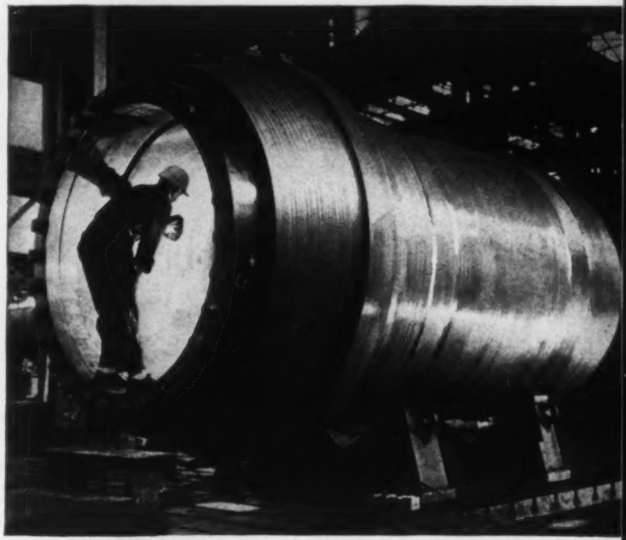
Steel

*for Strength*
*... Economy*
*... Versatility*

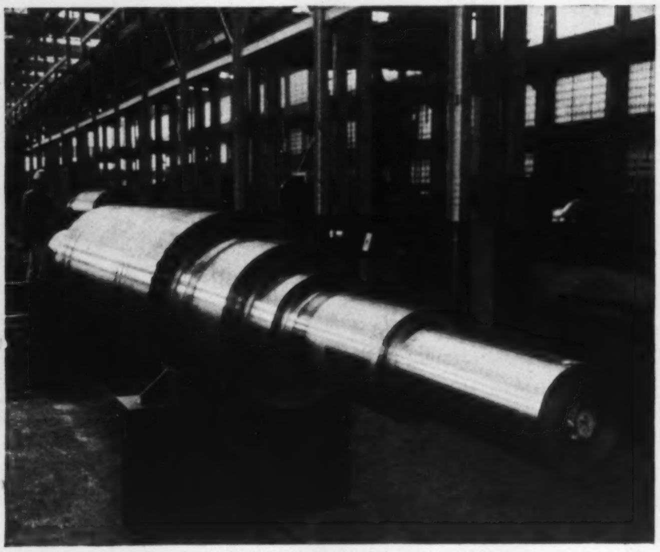
**RIGHT ON THE NOSE. Bethlehem meets your specifications exactly on all types of press, drop, and hammer forgings.**



RAM ADAPTER. This forging weighs 58,780 lb, and measures 140 in. x 73 in. x 25 in.



STEEL CYLINDER for use in 7,500-ton plate stretcher. This forging weighs 171,240 lb, and it's 17 ft, 3 in. long.



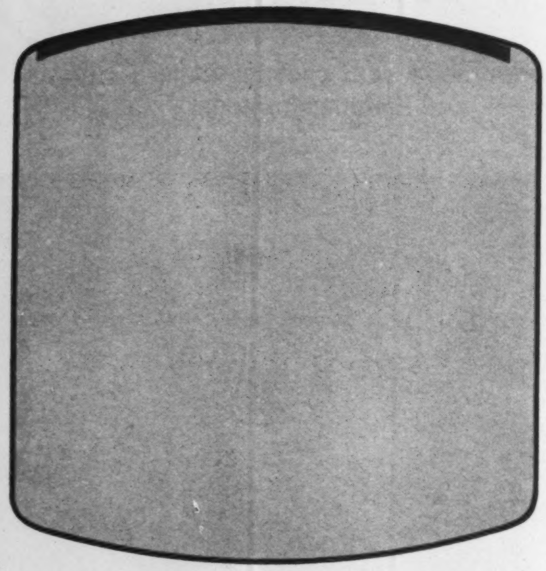
GENERATOR SHAFT. Weight, 198,240 lb. As you can tell from these photos, Bethlehem is well-equipped for machining.

REACTOR VESSEL CLOSURE. The OD of this 50,660-lb forging measures 12 ft.

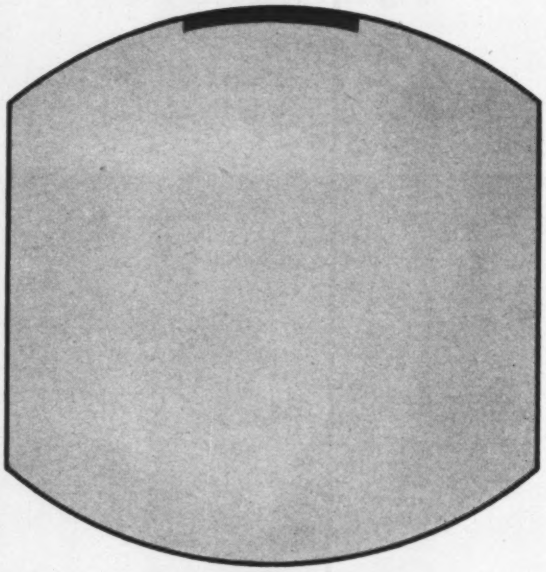
BETHLEHEM STEEL COMPANY, BETHLEHEM, PA. *Export Sales: Bethlehem Steel Export Corporation*

**BETHLEHEM STEEL**

BETHLEHEM STEEL



NEW: Now, SKF's improved "C" type design extends contact area over the entire length of a longer roller element.



OLD: In older flanged type bearings, effective contact area was no longer than the red line.

# CAPACITY:

## SKF®'s new "C" type bearing increases capacity as much as 54% by giving the roller some growing space.

The space was always there, but, until the SKF "C" type bearing, it was occupied by undercuts and fixed flanges. SKF removed them so the roller could be lengthened over a wider raceway.

Result: *The SKF "C" type bearing increases capacity up to 54%—corresponding to more than 4 times longer service life.*

SKF PUT THE GREATER LENGTH TO WORK. Length alone is not enough. It's only the raw potential for greater load-carrying capacity. A high capacity bearing has to be designed to *realize* that potential. Here's how the "C" type does it:

- CLOSE OSCULATION, that is close conformity between rings and rollers, distributes load evenly over the *entire* length of the roller.
- AN AXIALLY FLOATING FLANGE, combined with the symmetrical roller, assures automatic and *even* distribution of load under any combination of radial and thrust loads.

See for yourself! Ask your SKF man to show you his desk top demonstration of the new "C" type bearing.

6127

SKF MOTION ENGINEERING

*Advanced ball and roller bearing technology*

Do it
for
less

## ON A GISHOLT SUPERFINISHER

**MASTERLINE 81 Superfinisher**

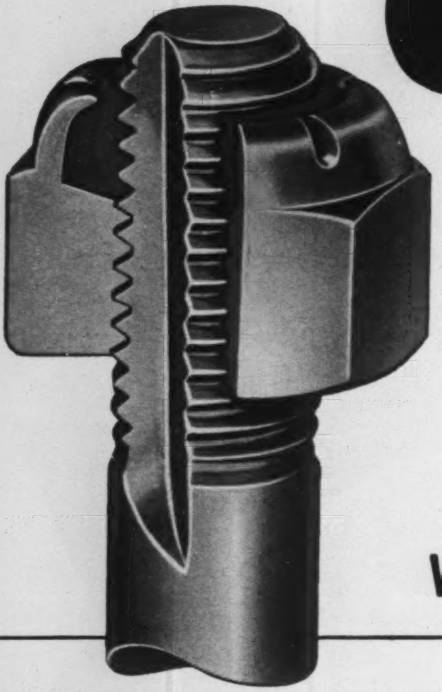
- A single spindle vertical Superfinisher.
- For flat, conical or spherical surfaces.
- Superfinishing cycle is automatic—operator just loads and unloads.
- Adapts to automatic handling . . . especially in-out conveyor systems.
- Vertical design saves valuable floor space . . . simplifies addition to existing production lines.

***The Model 81 is one of Gisholt's Superfinishers—ask Gisholt about the others.***

Flat, cylindrical, tapered and spherical surfaces can be *Superfinished* to specifications faster . . . at less cost. You can produce any controlled finish from 1 to 80 microinches rms *automatically*. In many cases you Superfinish directly after turning, boring or facing, without intermediate grinding. On other parts, you rough-grind and then Superfinish. Either way, you save initial investment, grinding wheel costs, production time, work-handling and floor space . . . and, you eliminate *skilled* labor! Write for Catalog 1169-C.

**GISHOLT**
MACHINE COMPANY
Madison 10, Wisconsin, U. S. A.

**Turret Lathes • Automatic Lathes • Balancers • Superfinishers • Threading Lathes • Factory-Rebuilt Machines with New-Machine Guarantee**



# TEST YOUR ELASTIC STOP® nut KNOW-HOW WITH THIS 60-SECOND QUIZ

① To provide controlled interference (locking torque) with bolt threads, the nylon locking insert of an Elastic Stop nut has an I. D. that is
**a.** ☐ *undersized* **b.** ☐ *same size*
in relation to major diameter of standard bolts.

② As bolt threads enter the nylon locking collar they
**a.** ☐ *cut* **b.** ☐ *impress*
perfect mating threads and bring bolt and nut thread surfaces into firm metal-to-metal contact.

③ An Elastic Stop nut
**a.** ☐ *increases* **b.** *diminishes* **c.** ☐ *eliminates*
wear producing axial play between bolt and nut.

④ Upon removal from the bolt, the nylon collar of an Elastic Stop nut
**a.** ☐ *retains its thread impressions.* **b.** ☐ *tends to resume its original shape.*

⑤ A nylon insert Elastic Stop nut can be re-used without losing its locking torque
**a.** ☐ *10 times* **b.** ☐ *25 times* **c.** ☐ *over 50 times*

⑥ An Elastic Stop nut will
**a.** ☐ *always* **b.** ☐ *sometimes* **c.** ☐ *never*
seize, gall or remove plating from bolt threads.

⑦ An Elastic Stop nut can be
**a.** ☐ *more accurately* **b.** ☐ *less accurately*
prestressed than an all-metal nut.

⑧ Regardless of vibration, impact or stress reversal an Elastic Stop nut will stay put
**a.** ☐ *anywhere on the bolt.* **b.** ☐ *only when torqued against the work.*

⑨ Fuels, lubricants, moisture
**a.** ☐ *can* **b.** ☐ *cannot*
seep past the chemically inert locking collar to cause corrosion of internal bolt-nut threads.

⑩ The single-unit Elastic Stop nut costs approximately
**a.** ☐ *more* **b.** ☐ *the same* **c.** ☐ *less*
to install than a castellated nut and cotter pin, or a double nut.

*Check Your Score*
①a. ②b. ③c. ④b. ⑤c. ⑥c. ⑦a. ⑧a. ⑨b. ⑩c.

Write Dept. S62-1060 for Elastic Stop nut Bulletin describing hundreds of Elastic Stop nut hex shapes and sizes—from 0-80 to 4″—in carbon and stainless steels, brass, aluminum and other alloys, in all standard finishes.

ESNA®
**ELASTIC STOP NUT CORPORATION OF AMERICA**
2330 Vauxhall Road, Union, New Jersey
*for the ring of reliability*

# Servicenter

Please direct all correspondence to attention of Ed Service, STEEL, 1213 W. Third St., Cleveland 13, Ohio.

October 23, 1961

## Advice to Presidents

The mails have been heavy with requests for reprints and additional information concerning our Sept. 25 article (Page 100) on "How to Become President," authored by News Editor Bill Dean.

We ran a quick check on the titles of managers doing most of the requesting. The winner? Presidents.

Apparently they are wondering how they got where they are.

## Letter from Holland

While we're on the subject of letters, we'll mention that we have just received one from Rep. Elmer J. Holland (D., Pa.), chairman of the House Subcommittee on Automation. He comments on our "Automation and Jobs" impact issue of Sept. 4: "I think you have done an excellent job and are to be congratulated."

Additional copies of the study are available at $2 a single copy; prices for larger quantities on request. Write Reprint Dept., STEEL, Penton Bldg., Cleveland 13, Ohio.

## Sardonic Motto

We had resolved not to print any more sardonic mottos, but this one, from American Cyanamid Co., is too good to overlook:

I've told you *a million* times not to exaggerate!

## New Product

Rep. John A. Blatnik (D., Minn.) of the House Rivers & Harbors Subcommittee reports on a new product. It's a gas-fired toilet that will help curb water pollution and meet emergency requirements for civil defense, flood, and hurricane conditions.

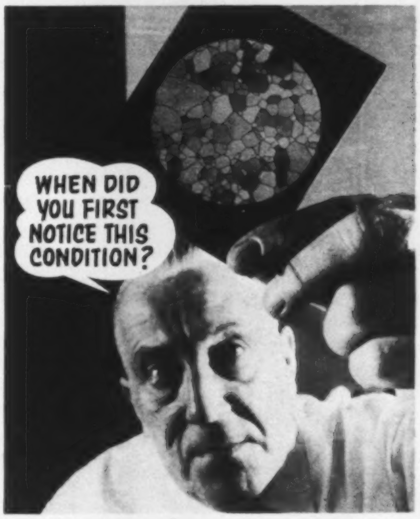
Waste matter is automatically caught in a sanitary paper container, explains the inventor, William H. Wood of Chicago. Upon completion of use, lowering of the seat cover causes the paper to be wrapped around the matter and dropped through a trap door into the combustion chamber beneath. Meanwhile, new paper is being fed into the unit and formed into a container for subsequent use. A control on the side of the unit is manually set to bring on the spark-ignited burner. The flame in the combustion chamber destroys the package completely, with temperatures ranging as high as 2000° F.

## Incidental Intelligence

Item: Yes, Virginia, there is a Santa Claus, in business. Corporations and businesses throughout the nation will spend more than $1 billion for their gift budget this Christmas, says the Selective Gift Institute, an outfit that offers a plan whereby the recipient selects the gift he likes best from a booklet that illustrates 10 to 14 gifts.

Item: Hanna Engineering Works, Chicago, will give $300 to the plant engineers or other company men finding the oldest Hanna power cylinders still being used.

## Caption by Geraldine


WHEN DID YOU FIRST NOTICE THIS CONDITION?

Geraldine, our cleaning woman and night editor, is persistent. So we'll let her have her way one more time. She finds photos that the editors stockpile and writes new captions without regard for the more sedate original and without regard for corporate images.

Here's another example of her prankishness.

STEEL, the metalworking weekly, is selectively distributed without charge to qualified management personnel with administrative, production, engineering, or purchasing functions in U. S. metalworking plants employing 20 or more. Those unable to qualify, or those wishing home delivered copies, may purchase copies at these rates: U. S. and possessions and Canada, $10 a year; all other countries, $30 a year; single copies, 50 cents. Metalworking Yearbook issue, $2. Published every Monday by The Penton Publishing Co., Penton Bldg., Cleveland 13, Ohio. Accepted as controlled circulation publication at Cleveland, Ohio.

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**CHROME SILICON**

*and*

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NEWCO means quality

**NEW ENGLAND HIGH CARBON WIRE CORP.**

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# SINTERING AL FRESCO*!

*Yes, OUT-OF-DOORS! Here's a Drever Furnace installation for sintering nickel briquettes at the plant of the Freeport Nickel Company, Port Nickel, Louisiana. Its outdoor setup eliminates the need for costly building space—but this is only one of its interesting features.

**HIGH LOAD CAPACITY— AUTOMATED OPERATION**

Built to handle continuous in-line 8800# per hour production of sintered nickel briquettes, this Drever Furnace combines the high loading capacity of a roller hearth with the material handling convenience of a conveyor belt furnace. It is a radiant-tube, natural gas fired, roller hearth type furnace, gas tight for controlled atmosphere operation.

**NO TRAY LOADING OR UNLOADING**

Material passes through the furnace on a continuous mesh belt which allows greater circulation of heat and gas for uniform production and eliminates the need for trays. Automatic handling equipment loads briquettes onto the belt and conveys the sintered briquettes from the end of the furnace for weighing and packaging.

**DREVER ENGINEERING FOR YOU**

This unique out-of-doors installation is an example of Drever application of sound engineering principles, and experience in the field of furnace design. Our engineering staff is available for consultation concerning your requirement—write or phone us. Drever Company, Bethayres, Pa. Phone: WIlson 7-3400.

**DREVER INDUSTRIAL FURNACES**

**ENGINEERED TO YOUR PARTICULAR REQUIREMENTS**

ENGINEERING AND MANUFACTURING FACILITIES AROUND THE WORLD THROUGH ASSOCIATES IN FRANCE, GREAT BRITAIN, GERMANY, ITALY, JAPAN AND INDIA

Standard Forge & Axle Co. forges 5-inch by ½-inch Pittsburgh Seamless Mechanical Tube ends down to 2⅝″ solid steel wheel spindle ends (cross section above). The Montgomery, Ala., plant then machines and grinds bearing surfaces to .0005-inch tolerance to produce single-piece, 20,000 pound capacity trailer axles. Trailer operators benefit from higher payloads because . . .

# They Throw Away The Holes—And Save Weight

The trick in making a seamless steel tube is piercing a hole in a round of solid steel.

But Pittsburgh Steel Company's Seamless Steel Mechanical Tubing makes the full circle in production of trailer axles at Standard Forge & Axle Co., Montgomery, Ala.

Standard, in effect, throws away the holes by forging the tube ends down to solid steel again, leaving only a hollow steel center and spindle section.

**The result:** a lightweight, one-piece trailer axle made entirely from a single length of seamless tube—including load bearing wheel spindles, precision ground for bearing and seal seats.

**The advantage: assured strength and safety of seamless steel, plus, for example, reduced axle weight for trailer operators in a 20,000 pound capacity axle.**

Starting with a seamless steel tube 5″ x ½″ x 87⅞″ for this particular axle, Standard upsets both ends, then swages them down to the shape of a spindle with a 2⅝″ solid end.

That's deformation of the roughest kind.

But Pittsburgh Seamless Mechanical Tubing takes it in stride, then bounces back under heat treatment with the physical properties required for precision finishing of the critical spindle surfaces, and the toughness necessary for a long life in hard service.

**And that kind of performance takes seamless steel tubes with exceptional internal soundness, consistent grain structure, and chemical and dimensional uniformity.**

Pittsburgh C-1040 grade Seamless Mechanical Tubing supplies these properties consistently—for this type

**After upset, Pittsburgh Seamless Mechanical Tubes, with 5-inch OD and ½-inch wall, are swaged to solid steel spindle shape on drop forge, at right. Standard's heat treating process refines grain, restores toughness of steel.**

20
ST
ST
ST
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D

**Standard also produces high-strength inserted spindle trailer axle by inserting forged alloy steel spindle with 4.065-inch OD into 4.040-inch burnished ID of 5-inch seamless steel tube under 50,000-pounds pressure.**

**Standard Forge & Axle Sales Manager James A. Rumbley says Pittsburgh Steel Company, as longtime major supplier of seamless mechanical tubes, "leaves nothing to be desired in product or service."**

axle and for Standard's high-strength inserted spindle type.

James A. Rumbley, Standard's sales manager, says:

"Trailer axles are high-weight carrying members subject to tremendous load shocks. So we use the finest materials available to assure our customers trouble-free service. Seamless steel mechanical tubes help us to do that, with complete safety and at less weight.

**"For many years, Pittsburgh Steel Company has been one of our major tubing suppliers. It has left nothing to be desired either in product or service."**

That's standard practice with Pittsburgh Steel—whether supplying seamless mechanical tubing to Standard's specific requirements, or to yours. Be certain with Pittsburgh Seamless. Contact one of the district offices listed below.

# Pittsburgh Steel Company

**Grant Building • Pittsburgh 30, Pa.**

DISTRICT SALES OFFICES
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Steel

ATLAS ELECTRONIC SCALE
THE ATLAS CAR & MFG. CO.
CLEVELAND 10, OHIO, U.S.A.

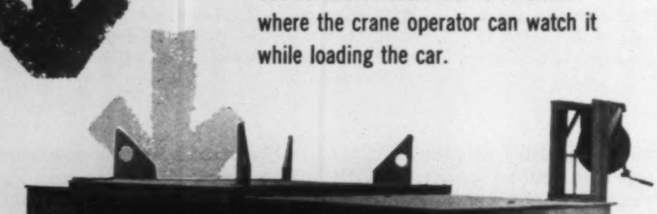
Tape Recording

Chart Recording

Atlas Builds Electronic Scales for-

Blast furnace scale cars
Coke weighing
Scrap bucket charging

This 60-ton scale car handles scrap buckets from the scrap yard to electric furnaces. For safety, the operator controls the car movement from a remote location. The electronic scale dial is mounted where the crane operator can watch it while loading the car.



*60-Ton Electronic Scale Car*

ATLAS CAR & MFG. CO.

1100 IVANHOE ROAD / CLEVELAND 10, OHIO

## CALENDAR

### OF MEETINGS

**Oct. 24-28, National Tool, Die & Precision Machining Association:** Annual meeting, Huntington-Sheraton Hotel, Pasadena, Calif. Association's address: 907 Public Square Bldg., Cleveland, Ohio. Executive secretary: Charles R. Bender.

**Oct. 25-28, Metal Treating Institute:** Annual fall meeting, Sheraton-Cadillac Hotel, Detroit. Institute's address: 271 North Ave., New Rochelle, N. Y. Executive secretary: C. E. Herington.

**Oct. 26-27, American Society of Tool Manufacturing Engineers:** Semiannual meeting, Royal York Hotel, Toronto, Ont. Society's address: 10700 Puritan Ave., Detroit 38, Mich. Executive secretary: Harry E. Conrad.

**Oct. 28, American Electroplaters' Society:** Annual technical seminar, Midwest regional council, Argonne National Laboratories, Lemont, Ill. Society's address: 122 12th St., Rockford, Ill. Secretary: Ellsworth Budden.

**Oct. 29-31, Fluid Controls Institute Inc.:** Fall meeting, Hotel Hershey, Hershey, Pa. Institute's address: P. O. Box 667, Pompano Beach, Fla. Executive secretary: E. R. Rath.

**Oct. 30-Nov. 1, American Gear Manufacturers Association:** Semiannual meeting, Edgewater Beach Hotel, Chicago. Association's address: One Thomas Circle N.W., Washington 5, D. C. Executive director: J. C. Sears.

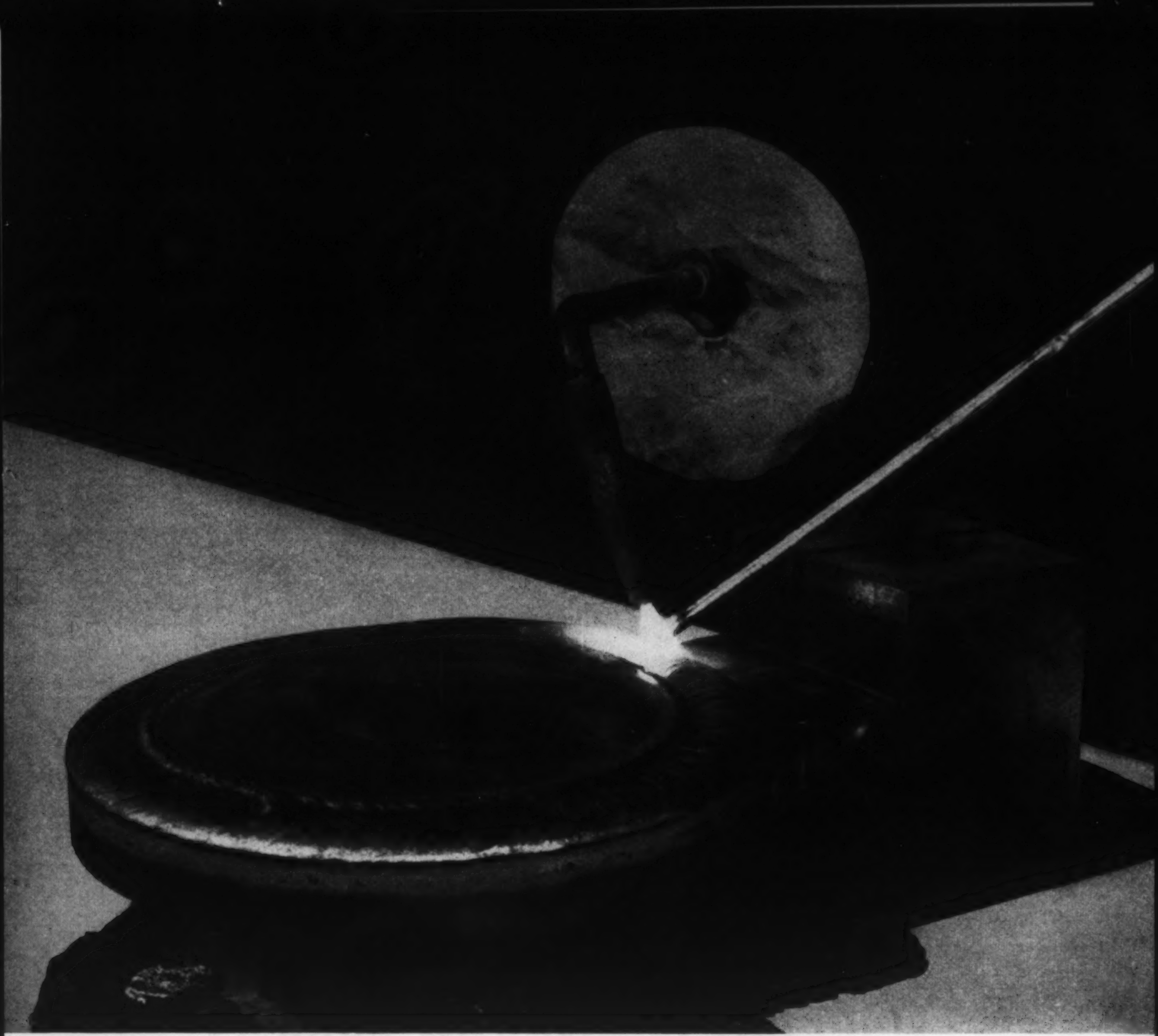
**Oct. 30-Nov. 1, Material Handling Institute Inc.:** Joint industry annual meeting, The Greenbrier, White Sulphur Springs, W. Va. Institute's address: One Gateway Center, Pittsburgh 22, Pa. Managing director: L. West Shea.

**Oct. 31-Nov. 1, National Metal Trades Association:** Biennial meeting, Hotel Commodore, New York. Association's address: 222 W. Adams St., Chicago 6, Ill. Secretary: Charles L. Blatchford.

**Nov. 1-3, Industrial Management Society:** Industrial engineering and management clinic, Pick-Congress Hotel, Chicago. Society's address: 330 S. Wells St., Chicago 6, Ill.

**Nov. 1-3, Malleable Founders Society:** Annual market development conference, Sheraton-Cleveland Hotel, Cleveland. Society's address: 781 Union Commerce Bldg., Cleveland 14, Ohio. Executive vice president: Lowell D. Ryan.

**Nov. 2-3, American Zinc Institute Inc.:** Galvanizers committee meeting of the steel industry, Sheraton Hotel, Philadelphia. Institute's address: 292 Madison Ave., New York 17, N. Y. Executive vice president: J. L. Kimberley.



HAYNES STELLITE cobalt-base alloy is used to hard-face this 8 in. valve disk used in nuclear equipment.

# Hard-Facing?

*There's a*
HAYNES Alloy
*for the Job!*

This 8-in. valve disk is being readied for rough service. It will soon be subjected to heat, abrasion, galling and erosion while handling radioactive water and steam.

It must operate properly . . . and for long periods. That is why the manufacturer has specified that its seating surface be protected with HAYNES STELLITE alloy No. 6. This cobalt-base alloy will withstand the severe service conditions . . . and the deposit can be machined to provide a perfect metal-to-metal seal.

HAYNES alloys can solve *your* metal wear problems, too. They provide exceptional resistance, can be applied to almost every metal, and are available as powders, bare rods, electrodes, tube rods, and coils. You can deposit them by any welding process . . . manual or semi-automatic. Write for full details.

**HAYNES**
**ALLOYS**
**HAYNES STELLITE COMPANY**
Division of Union Carbide Corporation
Kokomo, Indiana

UNION CARBIDE

**Address inquiries to Haynes Stellite Company,**
**270 Park Avenue, New York 17, N.Y.**

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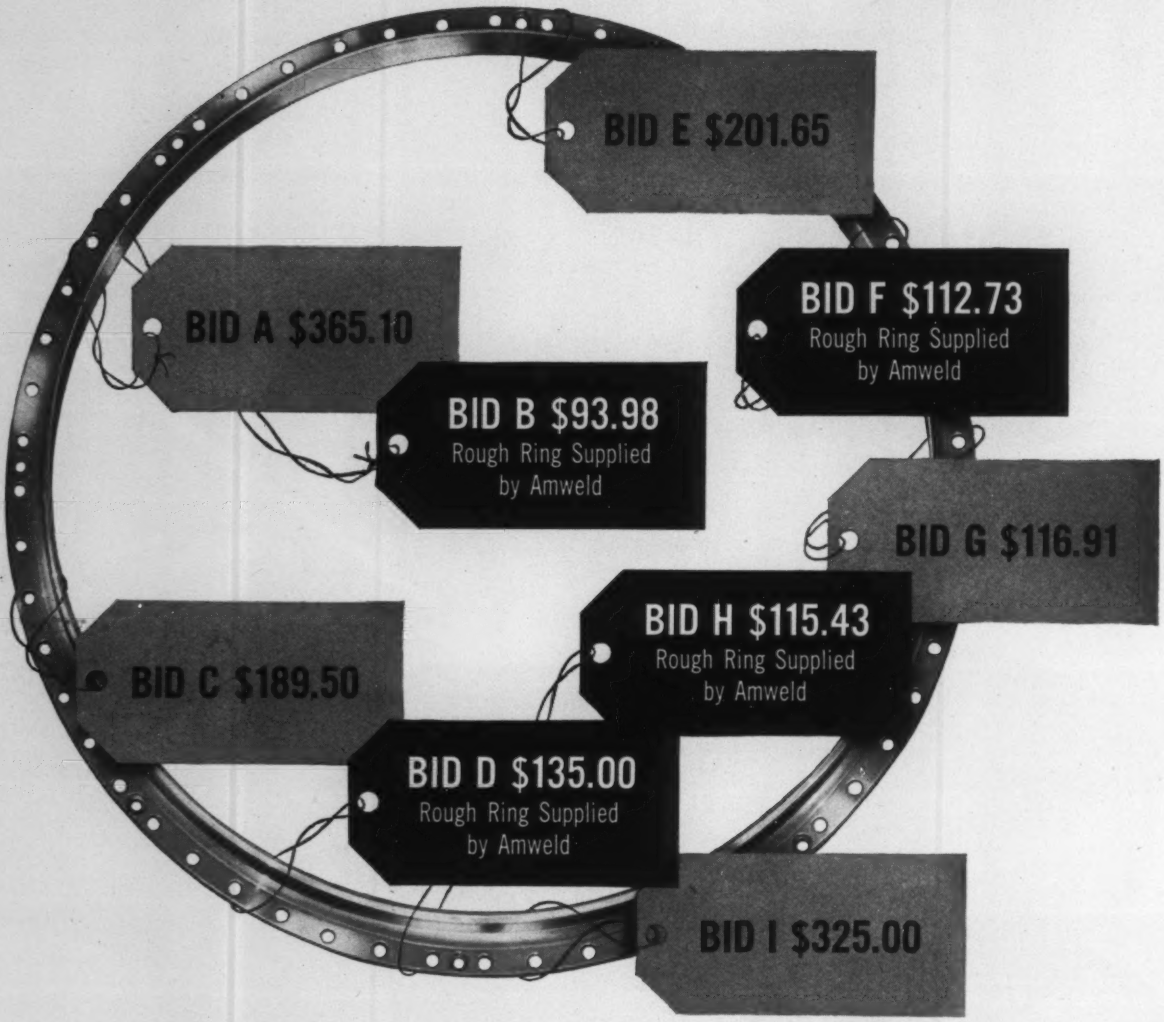
BID E $201.65
BID A $365.10
BID F $112.73 Rough Ring Supplied by Amweld
BID B $93.98 Rough Ring Supplied by Amweld
BID G $116.91
BID H $115.43 Rough Ring Supplied by Amweld
BID C $189.50
BID D $135.00 Rough Ring Supplied by Amweld
BID I $325.00

# FOUR OUT OF FIVE LOW BIDDERS BASE QUOTES ON ROUGH RINGS BY AMWELD

Early this year nine companies submitted manufacturing bids ranging from $93.98 to $365.10 on this circular jet engine turbine shroud. **Four out of the five lowest bidders submitted their finished shroud quotation based on rough rings, flash butt-welded, furnished by Amweld.**

Whether you're bidding for military or commercial business, Amweld flash butt-welded rings can save you money—can help you get more business. The quality of Amweld rings has been proved repeatedly in jet engines and missiles. The cost reduction opportunity presented by Amweld rings enabled Amweld customers to save over $1,000,000 on circular components and assemblies last year alone.

Investigate now! Let Amweld review your circular component requirements and figure actual cost savings to you with Amweld flash butt-welded rings. Send your drawings and specifications today: The American Welding & Manufacturing Co., 803 Dietz Road, Warren, Ohio.

**AMWELD®**
INDUSTRIAL PRODUCTS

THE AMERICAN WELDING & MANUFACTURING CO., WARREN, OHIO

# Metalworking Week®

October 23, 1961

## Why Foundries Are Closing Their Doors

Why does a 71-year-old foundry decide to close its doors? Stockholders of Superior Foundry Inc., Cleveland producer of gray iron castings, have voted to discontinue operations Nov. 10 despite the report that the firm "is not in financial difficulty." President Walter L. Seelbach cites these reasons for the closing: "The profit squeeze, excessive federal taxes which leave insufficient funds for reinvestment in the business, greater increases in wages than in productivity, and President Kennedy's request to manufacturers to hold the price line in the face of rising wage costs." Plagued by overcapacity, reduced demand, and competition from other fabricating methods, many foundries have closed their doors for the same reasons. The Gray Iron Founders' Society Inc. says that its members reported operations in September at only 66 per cent of "ideal" capacity.

## How Giveaway Selling Can Be Licked

"If selling (an) item means we are going to lose money on it, we prefer (that) the customer . . . buy it from another manufacturer," says Cliff Petersen, product manager, Line Materials Industries, Milwaukee. That stand is taken by the McGraw-Edison Co. division as it fights price fighting. The story on Page 40 tells how the firm halted "giveaway" selling by re-evaluating its prices and insisting that a profit should be earned on each product. Results of the policy and customer reactions to it are surprising.

## Steel Payroll Growing Faster than Employment

Steel industry employment increased to 545,293 in August—6910 over the July level and 67,750 above the January low point, reports the American Iron & Steel Institute. The payroll for hourly and salaried employees: $336.8 million in August. Compared with the August, 1960, figure, employment rose by 2625 (0.5 per cent) and payrolls swelled by $36.6 million (12 per cent).

## Eight Experts Pinpoint Welding Mistakes

STEEL asked eight welding experts to name the chief factors which influence welding efficiency. Their reply: Don't make do with outmoded equipment, check shop procedures, get expert advice on designing, review specifications, and select the right materials. For their tips on practices see Pages 70-75.

## More Engineers Plan Graduate Studies

The University of Detroit reports an increase of 55 per cent in the last year in the number of students in the top quarter of engineering classes who have indicated they will take postgraduate courses. The growing rate has had the effect of slowing the rise in average starting salaries for those accepting jobs. The university observes that between 1959 and 1960, monthly starting salaries rose $23 to $547. This year, the average advanced only $1. Observations concerning job selection: "Type of work ranks as the prime reason for selecting a particular job; location has replaced salary as the No. 2 reason."

## $800 Billion GNP by 1970—Hodges

Commerce Secretary Luther H. Hodges predicts our gross national product will total $520 billion in 1961. Full employment expected by the end of 1962 would guarantee a GNP of $575 billion next year. Mr. Hodges foresees a rise to $600 billion in 1963 and says we should achieve $650 billion by 1965. Secretary Hodges' forecast for 1970: We will "come close to a GNP of $800 billion."

## Indonesia Steps Up Economy—With Red Help

Indonesia is taking energetic strides toward acquiring the equipment it needs to meet the goals of its eight year plan. But the Iron Curtain nations are figuring heavily in the effort. Discussion of an economic and technical cooperation agreement with Rumania is in progress. Similar agreements with East Germany, West Germany, Poland, Czechoslovakia, and Hungary have been signed, and missions have been dispatched to Yugoslavia and Austria to study and select machinery.

## Aircraft Could Double as Satellite Booster System

B-52 and X-15 aircraft may play new roles in the U. S. aerospace program. Ford Motor Co. and North American Aviation Inc. have proposed that the manned planes operate as the first two stages of a satellite launch system. The B-52 would release the X-15 at an altitude of 50,000 ft. Climbing to 156,000 ft, the X-15 would launch a Blue Scout rocket. The recoverable booster system, substantially reducing the cost of putting a satellite in space, could be ready for a launching in nine months, say the firms.

## Magnesium Baseball Bat May Join the Lineup

Looks like wood, feels like wood, sounds like wood, but it's magnesium. Dixie Walker (left), star of the old Brooklyn Dodgers, shows an all-magnesium baseball bat to C. A. Howe, president, Magnesium Association. They attended the group's 17th annual convention in New York last week. The 6 million unit a year baseball bat market is but one of the new fields the magnesium industry is trying to crack. See Page 122.

## Improve Your Industrial Exhibition Displays

What do visitors want at an industrial exhibit? Clapp & Poliak Inc., New York producer of industrial shows, surveyed showgoers and finds these wishes expressed most frequently: Technically qualified, alert booth personnel; less high pressure selling; maximum number of products; more products in application; better technical literature; the newest products and information about R&D activities; exhibits that are convenient to study and understand; and fewer pretty girls.

## Inquiry System Features Voice Replies from Computer

Need information in a hurry? Just telephone a computer. This Unicall operator is composing an inquiry message on Remington Rand's new input device for Univac. Then she will dial the computer on the telephone adjacent to the set and receive a computer generated voice reply within 5 seconds. Unicall is expected to speed and simplify updating and reporting of data on such things as inventory, production, and sales.

## Stamping Plant Strike May Stall Ford

As of late last week, a strike remained at Ford Motor Co.'s Walton Hills stamping plant near Cleveland. If it continues, Ford Motor production of automotive lines, except Lincolns and trucks, will have to be curtailed this week. The problem arises because Ford management is trying to win "efficiency" provisions. Aim: Efficiency at the Walton Hills plant comparable to that of other company stamping facilities.

## Custom Diecasters Optimistic about 1962 Output

Production of aluminum diecastings in 1962 will reach a record high (the record, 376,230,000 lb in 1956), and zinc diecasting output will total 700 million lb (the record, 769,480,000 lb in 1955), predicts the American Die Casting Institute. The upturn is already being felt. Over-all diecasting output is expected to equal the 1960 rate by the end of the year.

## Steel Industry Ranks Among Lowest in Profits

"The profit record of the steel industry is a varied one, typical of cyclical industries," says the First National Bank of Boston. The bank points out: "Steel is not a large profitmaker, ranking in recent years no better than 30th in after-tax returns on net investment among 40 major industry groups."

## 'Packaged' Steel Home Set for Early '62 Debut

A new "packaged" steel home featuring a stressed steel skin structural system is scheduled for public introduction early in 1962. Development work has been carried out by Rheem Mfg. Co.'s Home Products Div., Chicago, in col-

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laboration with U. S. Steel Corp. The components will be made and marketed by Rheem's Building Products Div., Huntington Park, Calif. The division has been building classrooms since 1956, using the stressed skin, load bearing panel construction system.

## How TV and Radio Sales Stack Up

Production of TV sets at the end of the first eight months of 1961 was slightly above the level at the same point in 1960, says the Electronic Industries Association, but radio production lagged by 500,000 units:

| | Unit Production, January-August | |
|---|---|---|
| | 1961 | 1960 |
| Total TV | 3,699,188 | 3,694,184 |
| TV with UHF Tuner | 205,011 | 286,297 |
| Total Radio | 9,952,790 | 10,463,285 |
| Auto Radio | 3,153,293 | 3,991,961 |
| FM Radio | 473,799 | 565,665 |

## September Industrial Output Dipped

The first decline in seven months was registered on the Federal Reserve Board's index of industrial production last month. The seasonally adjusted index dipped to 112 per cent of the 1957 average from August's record 113 per cent. Durable goods production fell 3 points to 105 per cent. The board's explanation for the drop: Work stoppages and unfavorable weather.

## Straws in the Wind

Retail auto sales climbed to a new high (167,050 units) for the first third of October . . . National City Bank of Cleveland states: "Prospects are favorable for a 10 per cent boost in appliance sales next year, with further good growth in the years to come" . . . 2 billion containers will be used by 1965 for fresh and frozen baked goods, predicts J. R. Kitchen, product manager, Kaiser Aluminum & Chemical Sales Inc. . . . The Commerce Department forecasts motor vehicle registrations will reach 76 million in 1961, 2.8 per cent over last year's. Passenger cars will account for 63.5 million registrations . . . Bankruptcy cases filed in federal courts during the year ended June 30 reached an all-time high of 146,643, says Commerce Clearing House.

## Metalworking Pulse

**The Business Trend:** STEEL's industrial production index continues to be depressed by auto strikes. Conditions should improve late this month. **Autos:** A moderate rise in assemblies is on tap for the week ended Oct. 21 because of settlement of the Ford strike. **Steel:** Ingot output continues to slow down, as shown by the estimate for the week ended Oct. 21. You can look for production to level out or increase slightly in following weeks.

- **INDUSTRIAL PRODUCTION INDEX**

(1947-49 = 100)

| | |
|---|---|
| Week ended Oct. 7 | **167†** |
| Year ago | **152** |

Details on Page 57

- **PASSENGER CAR OUTPUT (UNITS)**

| | |
|---|---|
| Week ended Oct. 21 | **115,000*** |
| Year ago | **146,339** |

Details on Page 53

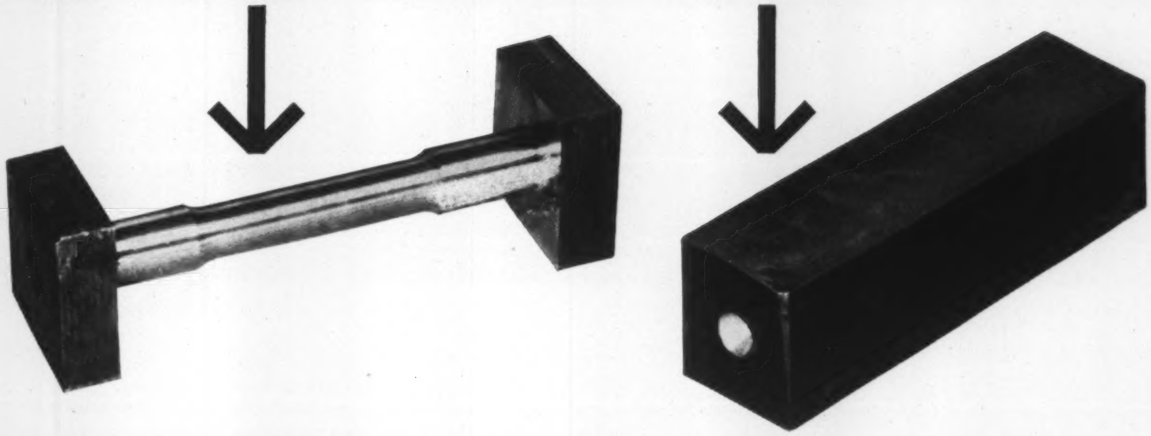
- **STEEL INGOT OUTPUT (TONS)**

| | |
|---|---|
| Week ended Oct. 21 | **2,050,000*** |
| Week ago | **2,071,000** |

Details on Page 106

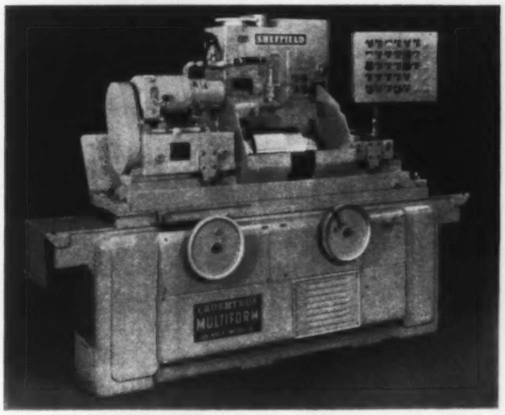
†Preliminary. *Estimated.

# 6 minutes to grind this from this



# with Sheffield Crushtrue® Grinding

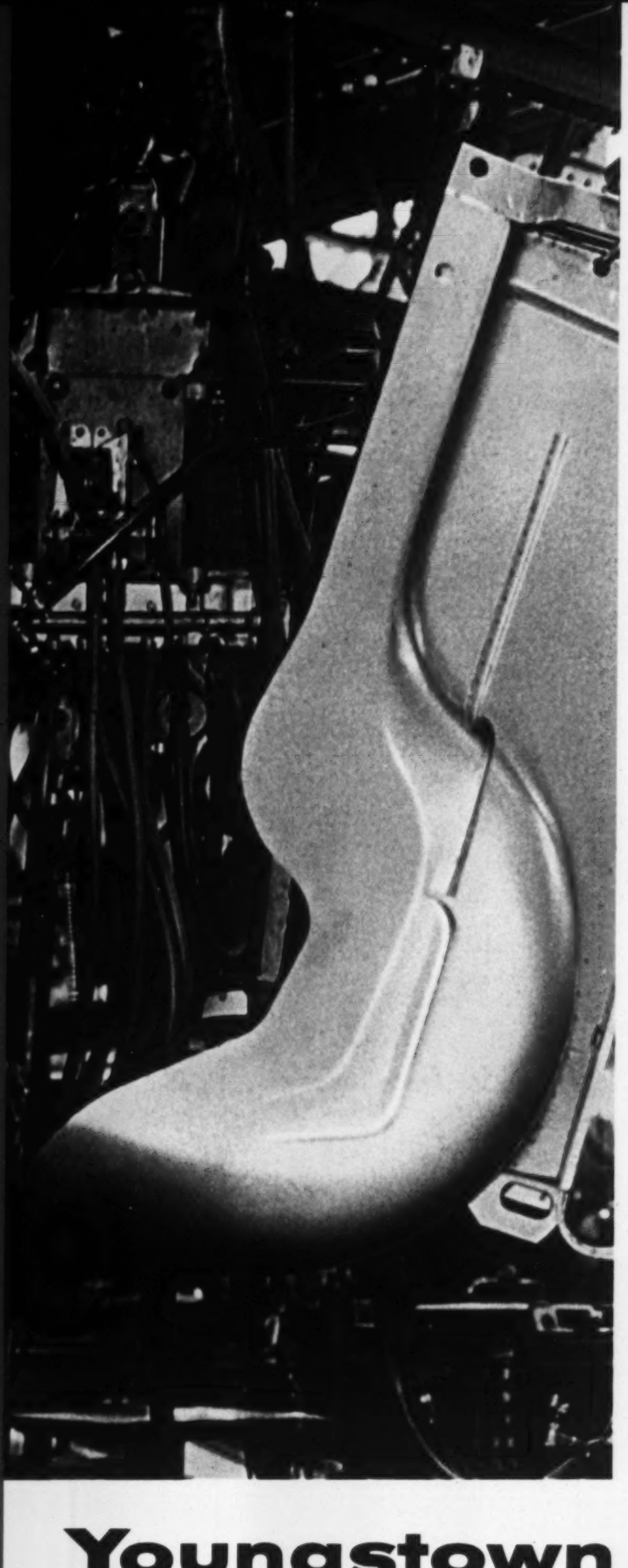
Crushtrue grinding of the 6-inch test specimen shown removes 8 cubic inches of metal to ±.001″ on diameter and is 8 to 10 times faster than previous machining methods. The high surface accuracy and finish eliminates the finish grinding and polishing usually required with lathe-turned specimens. Bars this same size are ground with the *same speed and accuracy* from this wide range of metals: 300 Series Austenitic stainless steel—High tensile steel alloy, 120,000 PSI—Armco Ingot Iron—Cold roll steel, SAE 1010 to 1020 range—Experimental tool steel, 1% carbon. This test specimen demonstrates the spectacular time savings, accuracy, and high surface finish attained on a wide variety of production parts by Sheffield Crushtrue Grinders. Write for these Crushtrue Process Bulletins: 180-55, FG181-260.



*The*
**SHEFFIELD**
*Corporation* *Dayton 1, Ohio*

*A subsidiary of The Bendix Corporation*

**Inspection Gages, Dimensional Control Instruments, Machine Controls, Automatic Gaging & Assembly Systems, Measuray® X-Ray Thickness Measuring, Crushtrue® & Multiform® Grinders, Cavitron® Ultrasonic Machine Tools, Press-Pacer® Transfer Units, Large Dies, Tooling, Contract Manufacturing.**



# DRAW

## New Youngstown rolling and annealing capacity means ready availability of higher quality sheet steel

New sheet steel from Youngstown thrives in an atmosphere all its own. In 50 new stack annealing furnaces, Youngstown sheet takes on the exact grain structure and degree of plasticity you need for forming. You get the precise working characteristics required for mild or deep drawing quality.

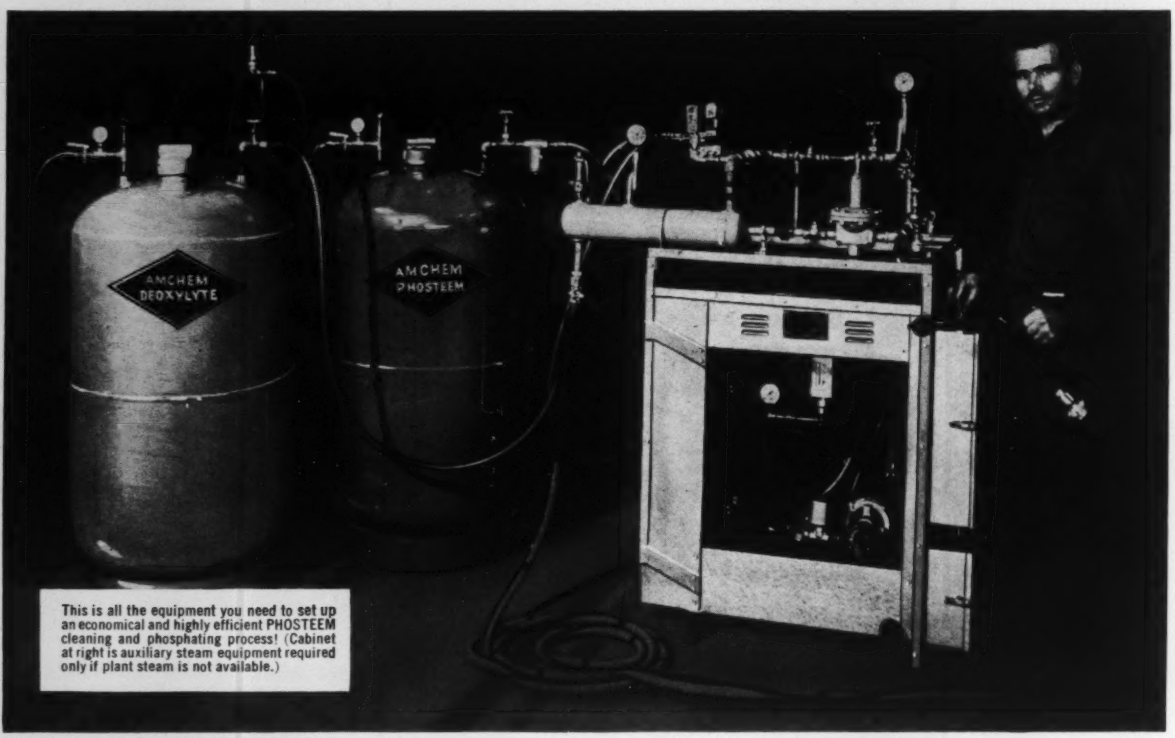
Quality control in annealing is only a part of Youngstown's sheet story. A modernized 79″ hot strip mill with electronic testing devices and automatic gauge control equipment assures you of more uniform quality steel sheet. This giant mill rolls huge 38,000 pound coils, delivers fewer welds, reduces your coil "down time." Prior to annealing, cold tandem mills reduce thickness to strict tolerances and give the sheet its exacting finish.

Order new Youngstown sheet in widths from 24″ to 72″. Use it in mild and deep draws. Work with it. You'll find it delivers all the qualities you need. Specify Youngstown sheet from 28 Youngstown District Offices or from your nearby Steel Service Center. Specify Youngstown's new annealing process. Specify softness. Or tempered hardness. You can depend on getting precisely what you want, when you choose Youngstown sheet.

**Youngstown – growing force in steel**

For full details on Youngstown sheet and annealing write: Dept. 11-D,
**The Youngstown Sheet and Tube Company, Youngstown, Ohio**

# Put a complete cleaning-phosphating department in your plant at a fraction of the cost and space of standard systems! AMCHEM PHOSTEEM*



This is all the equipment you need to set up an economical and highly efficient PHOSTEEM cleaning and phosphating process! (Cabinet at right is auxiliary steam equipment required only if plant steam is not available.)

Photo courtesy of the Electro Steam Generator Co.

**QUALITY COATING—**
the PHOSTEEM process cleans and phosphatizes metal surfaces simultaneously, even provides a final acidulated rinse, closely duplicating the quality obtained with conventional power spray washers. It increases corrosion resistance, adds paint bonding durability to any size or shape of virtually any metal alloy product . . . with coating uniformity far superior to hand and conventional steam cleaning.

**MINIMUM REQUIREMENTS—**
you can install a PHOSTEEM system with a surprisingly small investment. You can utilize existing plant steam or install an inexpensive steam generator.

**DOWN-THE-LINE ECONOMY—**
PHOSTEEM requires a minimum of floor space. Costly controls are completely eliminated. Yet you can use PHOSTEEM anywhere, anytime, for any kind of metal surface preparation!

If your production cycle is low or sporadic PHOSTEEM can be a wise investment to insure superior metal treating quality at a cost consistent with your production schedules. Call in your local Amchem Representative for the facts and figures, or write us direct for complete systems data.

*PHOSTEEM is a registered trademark of Amchem Products, Inc. for its cleaning and coating chemical.

**AMCHEM PHOSTEEM**

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**AMBLER, PA.** • Niles, Calif. • Detroit, Mich. •
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*In May, 1961:*

two major achievements
in Sendzimir
coating lines:

*The world's largest*

AT ARMCO STEEL CORPORATION

*The world's fastest*

AT YOUNGSTOWN SHEET AND TUBE COMPANY

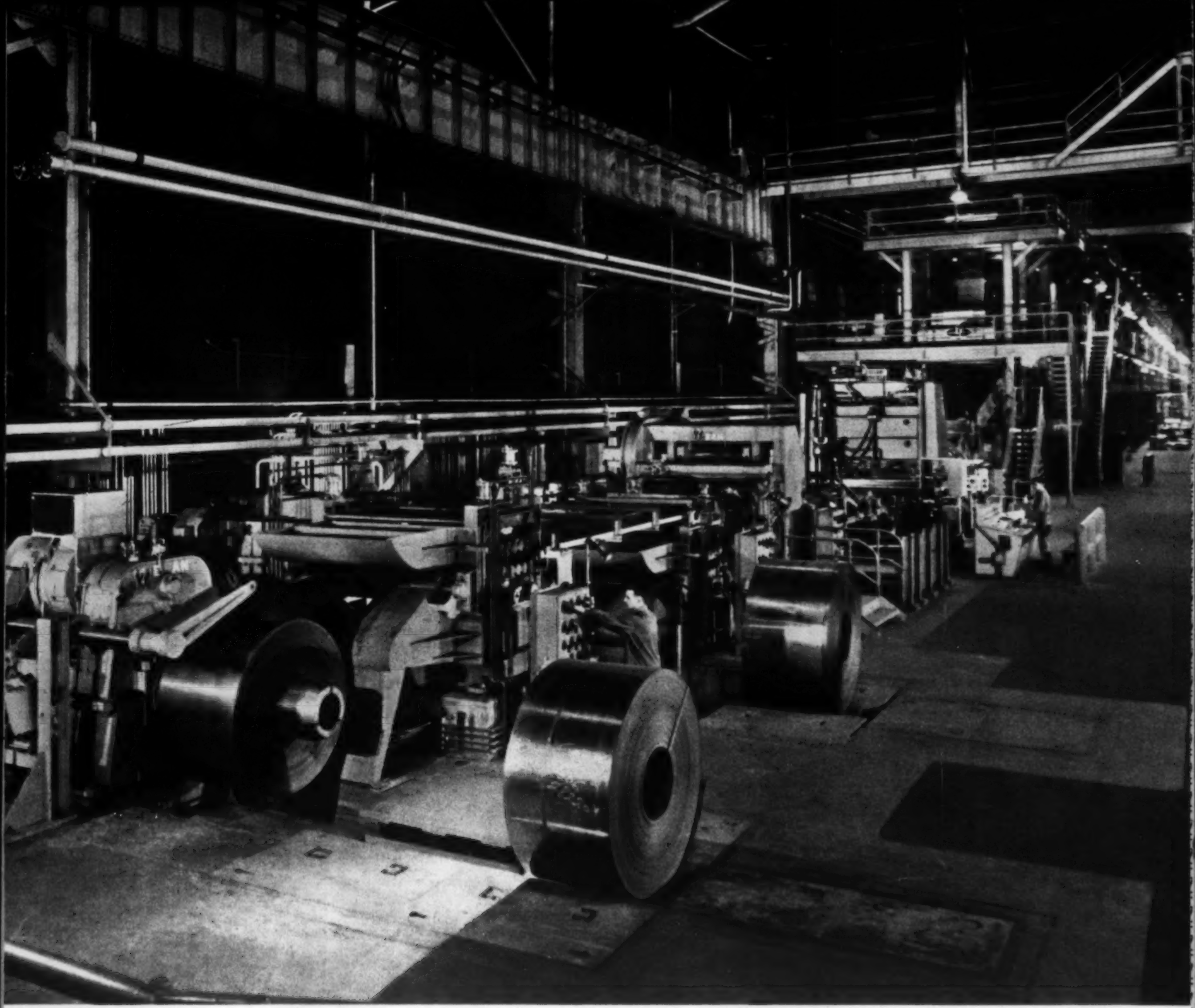
*Both lines*
*built by*
WEAN

# 72″

## Armco Steel Corporation

**The widest coating line in the world** at Armco's Middletown Works turns out zinc-coated steel coils and sheets up to 72″ in width. In addition to permitting Armco Division to meet growing demand for zinc-coated steels, this new **Wean-built** line will open many new design possibilities to Armco's fabricating customers by giving them greater dimensional latitude than ever before available.

Designed to handle strip from 11 through 22 gauge, the line employs the Armco-Sendzimir process of annealing and coating in one continuous operation.

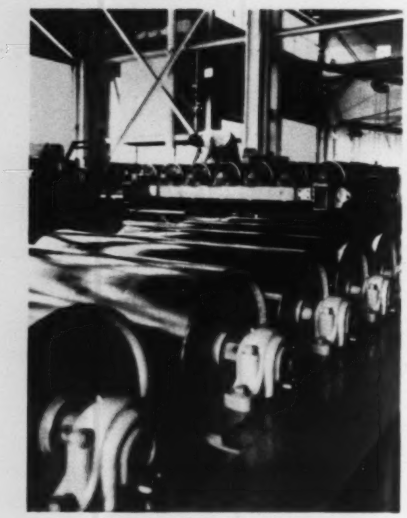


# 400 fpm

## Youngstown Sheet and Tube Company

**The world's fastest Sendzimir coating line** was installed by Youngstown Sheet and Tube Company at its Indiana Harbor works. Constructed by **Wean Engineering,** this line is designed to operate at speeds up to 400 feet per minute, and to handle strip widths up to 62″, and gauges ranging from 10 through 30.

Youngstown's new 848-foot line incorporates every modern facility, insuring superior quality zinc-coated sheets in both cut-lengths and coils; flat or corrugated.



# Planning new strip processing facilities? Talk to Wean . . .

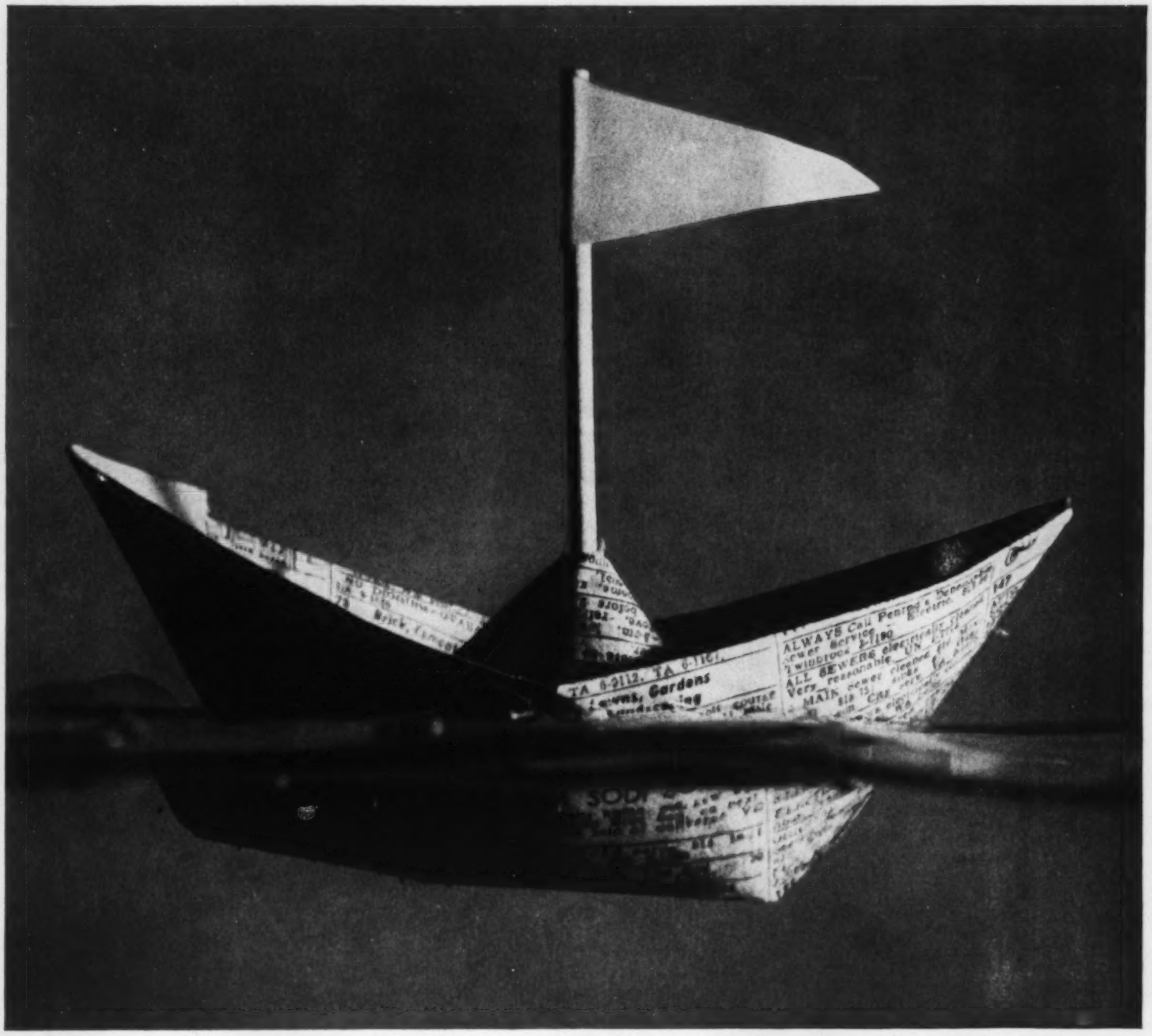
During this period of growing competition among producers of finished steel products, Wean has led the industry in the development of more efficient continuous processing facilities, designed to turn in additional profits for steel producers.

Wean processing equipment is precision-engineered and built to meet your exact requirements, the result of close coordination between our specialists and your engineering department, use of modern techniques by our experienced design staff, and the facilities of our specialized manufacturing operation.

Why not put this background of "creative engineering" know-how to work at improving profits in your continuous processing operation?

**THE WEAN ENGINEERING COMPANY, INC. • WARREN, OHIO, U. S. A.**

*How the Foundry Industry Serves America . . . #19 of a Series*



# SHOULD A MATERIAL BE LIGHT OR RIGHT?

Is there a simple solution to the problem of reducing weight? Well, there is one that *sounds* simple. Why not use lighter materials? That's what we did with the toy boat in the picture.

It's the lightest thing afloat. But lightness alone isn't quite enough, is it? Because the paper will get soggy and the boat will sink. Of course, we could process the paper and waterproof it. But why not save added expense and complexities by sticking to a material that's *naturally* suited to boat hulls?

Castings, too, can be made with lighter materials. But even complicated, costly "toughening up" processing won't give some lightweight metals the wear resistance, heat resistance, dampening qualities, strength, stability and machinability of reliable iron castings.

So why not stick with the proven material that's *naturally* suited to so many applications? Design engineers, together with their colleagues in the iron foundry industry, have already found many ways to lighten iron castings through improved design. This way they are achieving new weight reductions, economically and safely.

HANNA
THE BEST KNOWN NAME IN IRON

**THE HANNA FURNACE CORPORATION**
Suppliers of quality pig iron to the American Foundry Industry
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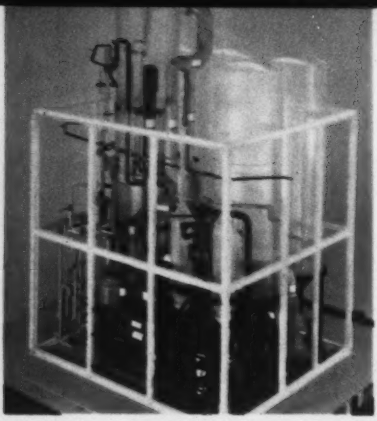
**NATIONAL STEEL CORPORATION**

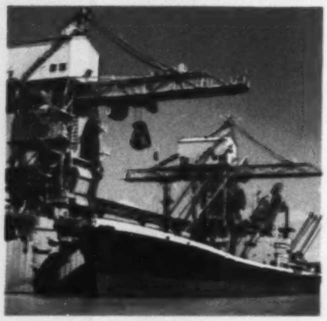
**ILLINOIS:** This Dravo-Lurgi sinter plant has rated capacity of 3900 tons per day. Over 45% of new U.S. sinter capacity added by steel industry in past five years are Dravo-Lurgi plants. A second Dravo-Lurgi pelletizing plant is being added for a large metal-producing company. Mail coupon for information on sintering, pelletizing, briquetting, beneficiation or other ore processing services.

**MINNESOTA:** Taconite shipping facility—2,334-foot dock, harbor and breakwater — built by Dravo on Lake Superior.



**MICHIGAN:** Engineering model of the cold box for 280-ton-per-day oxygen plant, now under construction for steel division of a major auto maker, will be first low pressure plant in U.S. to produce simultaneously gaseous and liquid oxygen without high pressure cycle. Dravo designs and builds air and gas separation plants under arrangement with Linde AG of Munich, Germany. Dravo turn-key services also include power and steam plants, water pumping and treatment stations, other plant utilities. Send the coupon for data.

**LOUISIANA:** Dravo-built twin unloaders and dock handle variety of materials at versatile ship/barge facility on Lower Mississippi. Rugged, efficient materials handling equipment can reduce costs of unloading ore, coal, other bulk commodities and containerized cargo for water-side plants and port installations. Send coupon for details.



**PENNSYLVANIA:** Dravo *Tru-weld* grating is produced by modern, highly automated equipment. It is used on all types of applications where open steel flooring and stairs are needed; is available direct or from distributors throughout U.S., in standard panels or fabricated. Check coupon for information.

**NEW YORK:** New forced air, stationary cooler, new sinter breaker, hot screening facilities and other plant modifications helped major steel producer improve sinter quality and production. Similar programs are underway for two other existing plants. Check coupon for information on stationary, induced-draft circular or straight-line coolers, breakers, screens or sinter plant modernization services.

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# Minnesota

## Sinter Plant in
# Illinois

## Oxygen Plant in
# Michigan

## Unloaders & Dock in
# Louisiana

## Grating in
# Pennsylvania

## Process Modernization in
# New York

Dravo Corporation, 4770 Grand Avenue, Pittsburgh 25, Pa

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- ☐ Water & Waste Treatment
- ☐ Ore & Coal Unloaders
- ☐ Sinter Plants & Coolers
- ☐ Pelletizing & Briquetting
- ☐ Oxygen Steelmaking
- ☐ Ore Beneficiation
- ☐ Oxygen Plants
- ☐ Mill Lubrication
- ☐ Turbo Blowers
- ☐ Space Heaters
- ☐ Ore Bridges
- ☐ Towboats & Barges
- ☐ Shafts, Tunnels
- ☐ Water Intakes
- ☐ Steam Plants
- ☐ Fabricated Piping
- ☐ Grating

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Company__________

Address__________

City__________ Zone_____ State__________

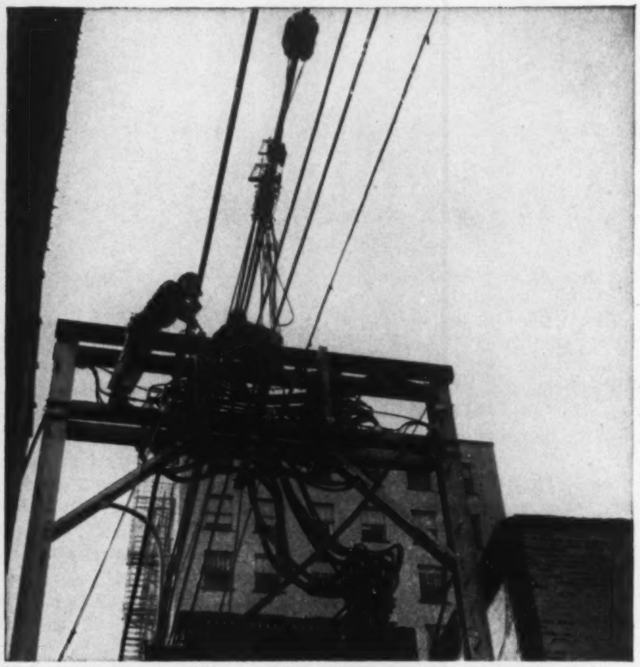
**DRAVO**

# NAME YOUR CABLE PROBLEM—THERE'S A GOOD CHANCE DURASHEATH CAN SOLVE IT.

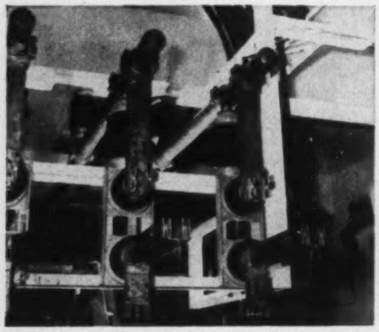
**—versatile rubber-insulated neoprene-jacketed power cable that facilitates circuit installation whenever—wherever needed—fast, easily, at low cost. Here are 5 examples.**

**Riser Cable.** In this installation, Durasheath not only serves as an aerial cable, but also as a riser cable running down the side of the building. Without additional terminations, it then drops down-inside to the plants' power-control center. It's another example of the way versatile Anaconda Durasheath adapts itself to your power cable needs.

**Installed in ducts.** Durasheath's flexibility meant quick and easy installation here. And once installed, its tough neoprene jacket assures long, trouble-free life. Because Durasheath adapts itself to so many uses, your inventory problems are lessened—fewer cables need be carried in stock.



**Field or factory-assembled aerial cable.** Durasheath may be factory pre-assembled with standard or reverse lay. Or it can be quickly field assembled with the simple spinning operation shown here. Either way, easy splicing, tapping, and terminating result in simplified installation. No cross arms or insulators are needed.



**Inside installation.** Here's an application where Durasheath was quickly installed and easily terminated. Durasheath's Neoprene jacket resists abrasion, heat and fumes. *Assures dependable performance and long-range economy.*

**ANACONDA DURASHEATH ALL-PURPOSE POWER CABLE** is available in all sizes, single and multiple conductor, copper or aluminum, 600 to 35,000 volts. *Insulations:* Type RHW, Anaconda ANW, AHW, or AB butyl rubber compounds; each designed for specific purposes. *Jacket:* specially compounded neoprene with high resistance to flame, oil, acids, alkalies, sunlight, and ozone. Has high tensile strength and is flexible over a wide range of temperatures.

**Direct-burial cable.** The moisture-, oil-, and acid-resistance of Durasheath's jacket makes it the ideal cable for direct-in-the-ground applications like the one shown above. Its flexibility cuts installation time and cost because Durasheath is easy to handle. Its durability cuts maintenance costs.

For complete information about Anaconda Durasheath contact Anaconda Wire & Cable Company, 25 Broadway, New York 4, New York, Department EFL-1-S.

61358-P

ASK THE MAN FROM

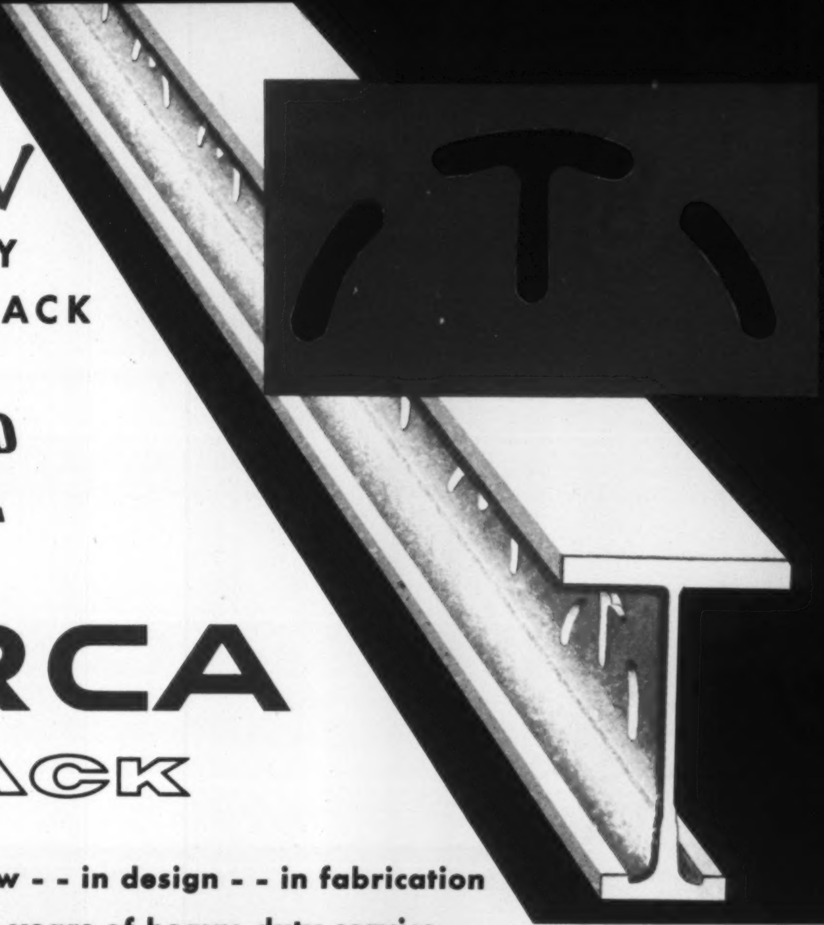
**ANACONDA®**

FOR DURASHEATH ALL-PURPOSE POWER CABLE

# A NEW

## HEAVY-DUTY OVERHEAD TRACK
## BY
## CLEVELAND TRAMRAIL

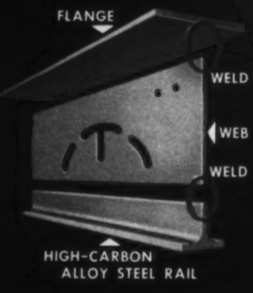
# TARCA
## TRACK



- Completely new - - in design - - in fabrication
- Assures more years of heavy-duty service
- Great rigidity
- Maximum strength with minimum weight
- Design readily proportioned to suit any load condition
- Overcomes track peening
- Greater range of sizes
- New support fittings expedite erection

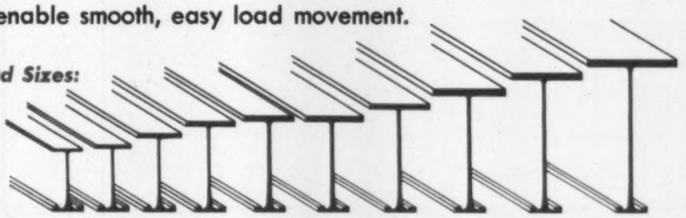
Cleveland Tramrail Tarca Tracks are a tremendous innovation in the overhead materials handling field. Another great improvement among many by Cleveland Tramrail to keep it far in the lead.

Tarca Tracks are straight, true, accurate—have flat raised treads—of hard, high-carbon alloy steel—prevent peening—provide greater wear resistance—enable smooth, easy load movement.



Tarca Tracks are made under carefully controlled conditions. The three parts, top flange, web and alloy steel rail, are joined by continuous welds to form an integral one-piece section.

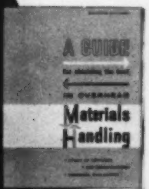
*10 Standard Sizes:*



Sizes range from 8″ to 20″. Also special sizes are easily made to suit any overhead crane or monorail requirement. Tarca Track matches with existing Cleveland Tramrail track installations.

*Ask for this helpful booklet—No. 2032*

Covers all major features the buyer should know about overhead materials handling equipment. Has complete story on Tarca Track. Contains detailed equipment specifications and handy proposal evaluation form.



**CLEVELAND TRAMRAIL DIVISION**
**THE CLEVELAND CRANE & ENGINEERING CO.**
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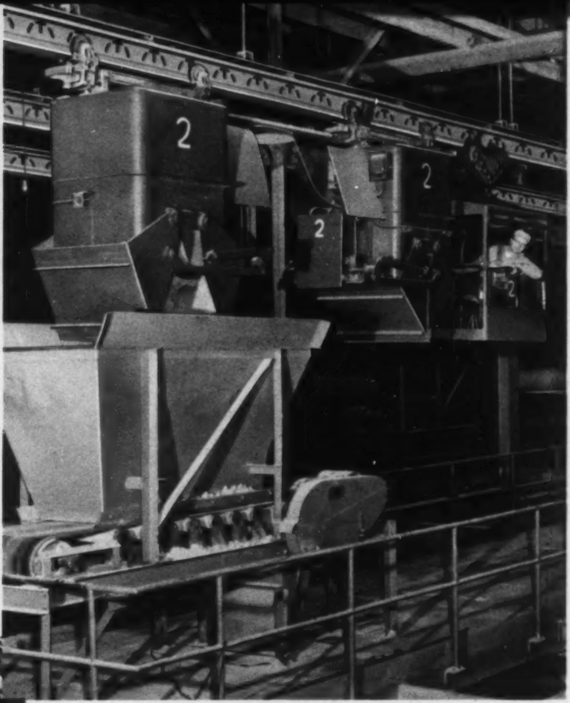
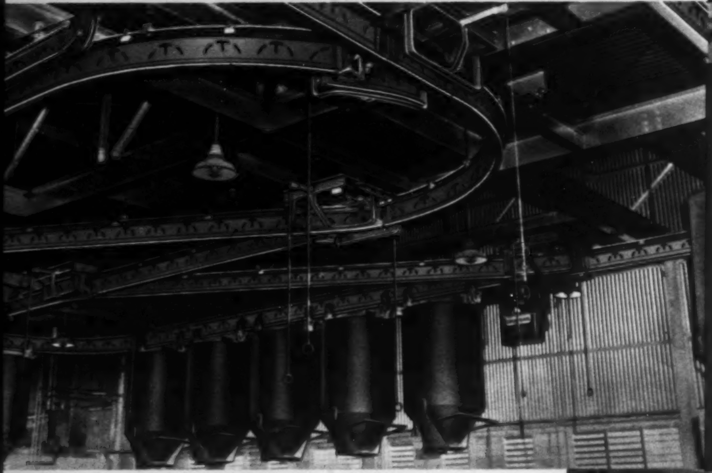
*Trade—mark of durability and strength —punched into all Tarca Tracks.*

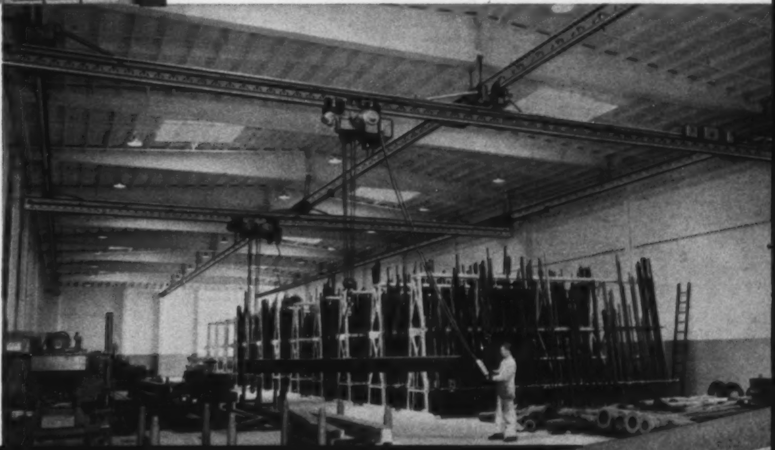
Cleveland Tramrail has an enviable reputation throughout the Ceramic Industry for outstanding performance. Customers have reported that their installations subject to heavy, continual usage are serving them far beyond expectations. ▶





◀ In the Glass Industry Cleveland Tramrail advanced a method of handling mixed ingredients in buckets traveling between mixer and furnaces which prevents segregation. This has proven so successful in assuring uniform quality that today the entire production of many glass plants is dependent upon equipment like that illustrated here.

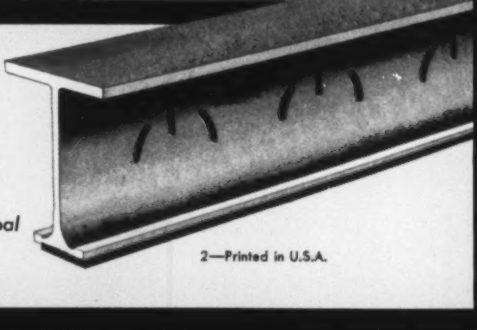
Cleveland Tramrail floor-operated cranes are such an important factor in handling heavy materials and cutting costs that there are now thousands of installations serving factories, mills and warehouses. Tarca Track is of real advantage for crane systems because of its great resistance to deflection. ▶



***Your Cleveland Tramrail Sales Engineer is Qualified to give you the Complete Design and Application Story on This Revolutionary***

## NEW TARCA TRACK

*Cleveland Tramrail is represented by competent, experienced engineers in all principal cities of the United States and Canada. Contact address on other side.*



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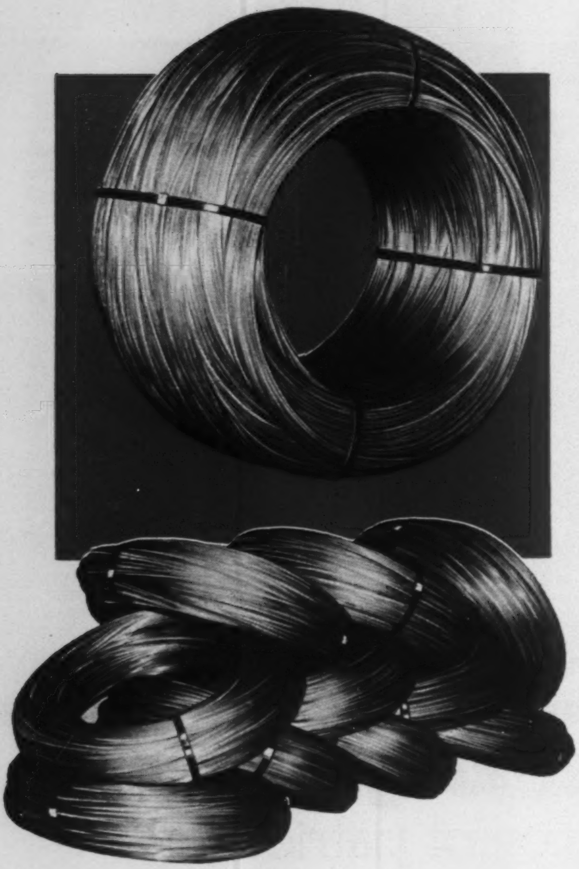
# In Brite Wire Fabricating—*here's how advantages of* DSC-Portsmouth LPR Coils *over short-run bundles show up in your*



The LPR Coil at the top contains 2955 lbs. 11 ga. spring wire. It occupies a space of 24.5 cu. ft.

The 10 bundles in the lower picture weigh 3050 lbs. (also 11 ga. spring wire). They average 305 lbs. each and, even as "ricked", occupy a space of 90 cu. ft.

## ❶ space,
## ❷ handling,
## ❸ unit manufacturing
## ❹ and material costs

**1-space:** The pictures at the left show how the small bundles waste 65.5 cu. ft. out of 90 cu. ft. That's 72.8%. What's more, LPR's are self-supporting and readily accessible.

**2-handling:** With LPR's (1000 to 4200 lbs.) you make fewer moves for a given weight of inventory. Users report up to 80% saving in unloading time alone.

**3-manufacturing cost:** LPR's cut your downtime frequency as much as 95%. That means you produce more per man-or-machine hour. Users report up to 33⅓% increase in productivity and proportionately lower unit man-hour costs.

**4-unit material cost:** The needless coil changes you avoid reduce the remnant scrap you generate by as much as 95%. As your yield goes up, your material cost per unit drops.

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October 23, 1961

# Giveaway Selling

In a survey by this magazine, metalworking managers are being asked to name their biggest single problem.

Of the first 1000 to reply, 712 say it is price fighting.

Putting it another way: Price fighting mentions outnumber total mentions of such major headaches as union demands, inadequate depreciation allowances, and foreign competition by more than two to one.

We are shocked by the statistics. They indicate that ruinous price wars are becoming more rather than less a problem. A year ago, 56 per cent of metalworking managers said price fighting was their No. 1 problem.

Many metalworking problems are caused by factors over which the industry's managers have no or at least limited control. The solutions often aren't wholly within the province of industry. The matter of inadequate depreciation allowances, for example, depends upon corrective action by the government.

But price fighting is a problem for industry itself to solve. Its causes spring from industrial managements' decisions. Its correction lies within industry's self-discipline.

For that reason, we are always interested in case histories of companies or industries that undertake to eliminate senseless price fighting and its inevitable result—the erosion of profits.

Line Material Industries of Milwaukee provides such an example (Page 40). Two years ago, the company decided to stop selling at a loss.

First, it re-evaluated its true costs and its prices.

Then it adopted a policy—no profit, no sale.

Result: Volume dropped, but the operation became profitable after a ten year period of losses.

Line Material's experience may offer a guide and a promise to other companies and industries suffering from overdoses of price fighting. In its simplest form, it suggests:

Quit giveaway selling!

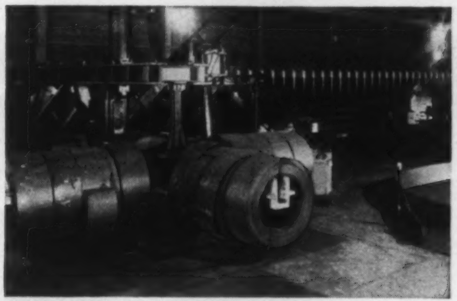
Walter J. Campbell

EDITOR

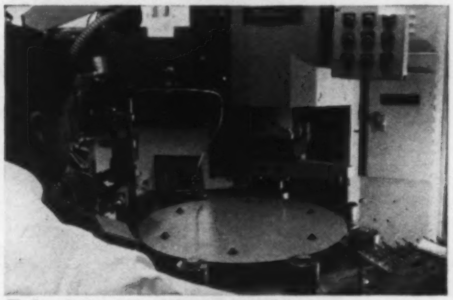
Warco PRESS
400-2-60

◀ ***Warco Press Line*** composed of three 400-ton straight side, eccentric gear presses forms automobile wheel "spiders" at The Budd Company's Detroit plant. Here, William F. Longfield, manager of press engineering and sales for McKay's Federal-Warco Division, looks over a finished wheel with Edwin Seiberlich, works manager, and R. O. Greenshields, plant manager.

Photo by ARNOLD NEWMAN



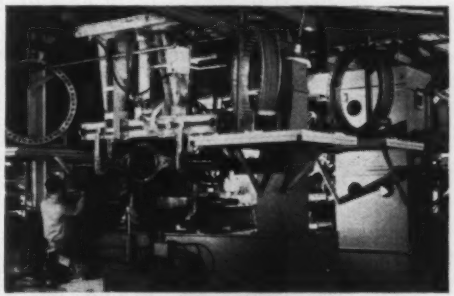
***McKay Tube Mill Feed Line*** sends steel to the tube mill continuously at a rate of 1,800 fpm at U. S. Steel's National Tube plant at Lorain, Ohio.



***Federal Dial Feed Projection Welder***, one of several used by the Bendix Corporation to weld transistor assemblies. It will weld 2,000 assemblies per hour with exacting precision.

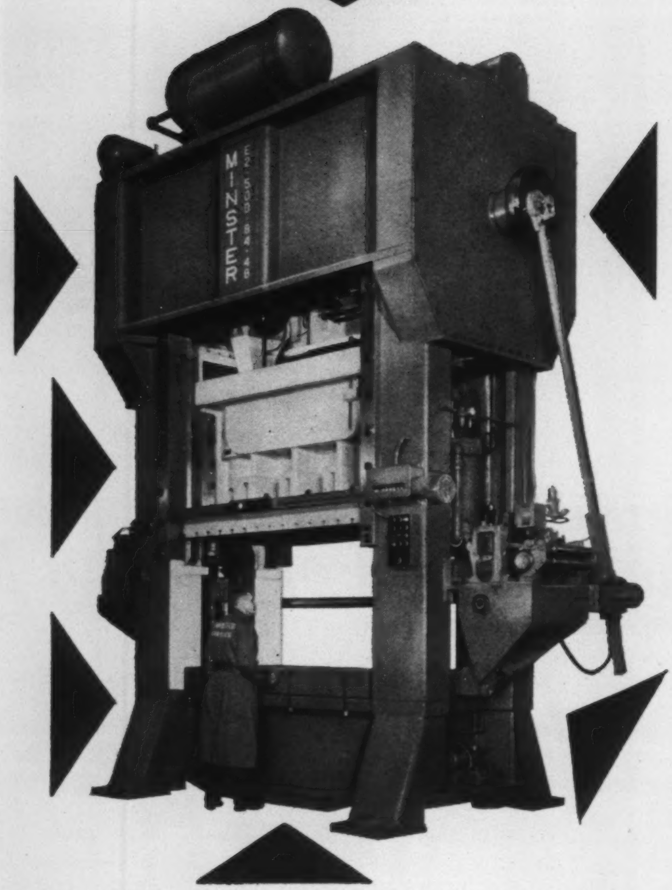
Uncoiling, flexing, processing, slitting, shearing, feeding, forming, stamping, and welding . . . keeping ***metal in motion*** in the most economical manner possible, from coil to finished product, ***is the business of McKay Machine.***

McKay Machine, its divisions and subsidiaries produce the widest range of metal preparation, processing, forming and welding equipment available anywhere. Because of this they can design and build complete, integrated production lines of perfectly mated machinery. This makes it possible to achieve compactness and bring about efficiencies not otherwise practical. It also means the manufacturer is concerned with only a single source of responsibility and supply. That's why more and more cost-conscious metalworking firms are making it a point to know *The McKay Machine Company, Youngstown 1, Ohio.*



***Berkeley-Davis Automatic Fusion Welding Lines***, such as this one of two recently installed at American Metal Products Company in Detroit for the automatic production of over 200 sizes of motor vehicle axle housings, lead the industry in precision operation, production efficiency, and flexibility.

# HIDDEN STRENGTHS and VALUES



There are many points of superiority in a Minster E-2 Heavy Duty Blanking and Progressive Die press . . . most of which are not immediately obvious at a glance. You might call them "hidden strengths and values." For example, the speed possibilities, the full eccentric shaft . . . the unique frame design.

If you buy with an eye to better all around performance, take a close look at the Minster E-2. 200 to 800 tons.
**The Minster Machine Company, Minster, Ohio**

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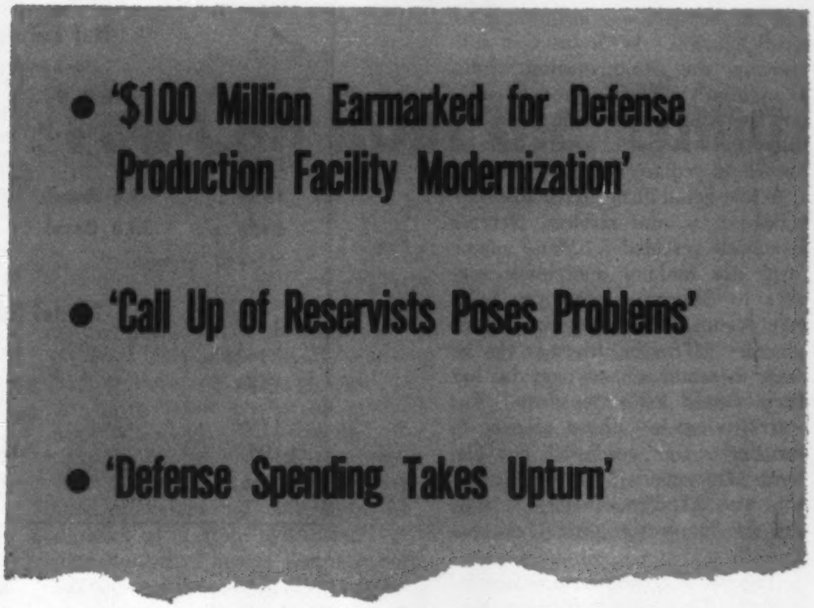


- '$100 Million Earmarked for Defense Production Facility Modernization'
- 'Call Up of Reservists Poses Problems'
- 'Defense Spending Takes Upturn'

# Signs That World Tensions Hit Home

DESPITE indications that world tensions may be easing, the crises in Berlin and elsewhere are being felt in metalworking. Some of the signs:

- The Defense Department, which hasn't been spending the funds allocated to it for the modernization of its production facilities, has earmarked $100 million for machine tools and production equipment in fiscal 1962. That compares with $40 million in the previous year.
- Defense spending in fiscal 1962 will probably total $46.6 billion compared with $43.2 billion last year. Effects of the administration's speedup are reaching metalworkers now because a lot of the money is going for military hardware.
- A few companies have problems caused by the callup of reservists. Others are making manpower surveys to determine where they might be hit and what can be done about it.

• **Where Tools Will Go**—Defense Department officials report that the $100 million modernization appropriation for fiscal '62 (it started last July 1) will be allocated to the services this way: $60 million for the Air Force, $25 million for the Army, and $15 million for the Navy.

They estimate that about 60 per cent of the money will go for machine tool replacement and 40 per cent for new production lines. Most of the funds have not been committed, but it's expected that they will be prior to July 1, 1962.

• **Defense Spending**—In the quarter just ended, defense expenditures reached an estimated $11.3 billion compared with $10.3 billion a year ago. An increase in each of the next three quarters is expected. A high of $11.9 billion in the final fiscal 1962 period is anticipated.

Metalworkers are also feeling the impact of the administration's attempts to broaden the defense production base. Examples: Thompson Ramo Wooldridge Inc., Cleveland, landed the M-14 rifle contract—previously, two other firms were the only suppliers. Coming up: Two more builders of the M-113 armored personnel carrier will be named. To date, FMC Corp., San Jose, Calif., has been the sole source.

Another point worth noting: Just because you haven't been in on the development work for a project, it doesn't mean you haven't got a chance in the production bidding. Le Tourneau-Westinghouse Co. recently won a contract for the

LARC, an Army amphibious vehicle. Borg-Warner Corp. did most of the development work.

**• Military Buildup**—A Defense Department spokesman reports that the buildup of military manpower is not over. About 155,000 reservists have been ordered to active duty, and the services are authorized to recall 250,000. With troubles still brewing, the administration wants to maintain a high degree of military readiness. As men complete their tours of duty, others will be needed to replace them.

A few small firms have lost key personnel to the services, STEEL's spotcheck revealed. Many major firms are making manpower surveys to determine employee military status. Defense officials emphasize: "There's little that can be done to retain a man once he has been alerted for active duty." But reservists can act ahead of time to transfer to the standbys. The Defense Department puts reservists into the standby category if they are in "currently critical occupations."

The list of critical occupations includes: Blast furnace blowers, boilermakers, coremakers, die setters, professional engineers, machinists, mathematicians, rolling mill operators, tool and die designers, tool and die makers, and technicians in engineering and physical sciences.

**• Fallout Shelters** — Several steelmakers were quick to offer fallout shelters, and the potential has since attracted a host of companies. The shelters are only part of it—companies making blowers, air filters, batteries, canned foods, and other equipment see big opportunities if shelter sales catch on.

Predicts F. F. Norton, temporary president of the newly organized National Shelter Association: Fallout shelter spending could total $200 billion over the next 15 to 20 years.

**• Contrasts**—There are significant differences between today's situation and the one that prevailed during the Korean conflict: We have no scare buying, or shortages of materials, components, or equipment. Industry has the capacity to meet the nation's needs in and orderly fashion.

# Below-Pattern Pacts for Chrysler, Studebaker?

**Net Earnings**

(In millions)

| | CHRYSLER | STUDEBAKER-PACKARD |
|---|---|---|
| 1961 | $15.7 (loss)* | $10.3 (loss)† |
| 1960 | 32.1 | 0.7 |
| 1959 | 5.4 (loss) | 28.5 |
| 1958 | 33.8 (loss) | 13.4 (loss) |

*6 months. †9 months.

**Model Runs**

| | CHRYSLER | STUDEBAKER-PACKARD |
|---|---|---|
| 1962‡ | 92,000 | 23,600 |
| 1961 | 691,069 | 65,114 |
| 1960 | 894,149 | 125,800 |
| 1959 | 703,744 | 131,508 |

‡Through Oct. 21.

THE UAW IS moving on Chrysler Corp. Walter Reuther continues to assert that he won't let the company settle for less than Ford and General Motors did.

Chrysler has intimated it wants and needs a below-pattern settlement. It also hopes to avert a strike, but that may be difficult. Even if the UAW does not authorize a national walkout, several locals have said they'll strike anyway. The company has a long standing record of wildcat walkouts over speedups and seniority.

**• Chrysler's Status** — The UAW has 77 national contracts covering 90,000 hourly workers in Chrysler's 45 plants. Straight time hourly earnings average $2.55. As of Oct. 21 Chrysler had produced an estimated 92,000 of its 1962 cars. That compares with 360,000 for GM and 220,000 for Ford. Rambler's 1962 model output stands at 57,000.

If Ford and GM negotiations make a pattern for the UAW, Chrysler can look for about ten working days of strikes too. The company's net loss for the first six months is $15.7 million. With current sales rates approaching its excellent 1955 levels, Chrysler needs all the production it can get. That could be a point in favor of a peaceful settlement.

**• Studebaker's Troubles**—In South Bend, Ind., Studebaker-Packard Corp. is carrying on its talks with the UAW. Gerald Gallagher, industrial relations director, is leading S-P's negotiations. The company has built 23,600 cars since new model production started in mid-August. It showed a nine month loss of $10.3 million, although Sherwood Egbert, president, says the fourth quarter will be in the black and may wipe out previous losses.

Expectations are that S-P will win a below pattern settlement this time, as in 1958. S-P's UAW members total 6500.

Two contractual areas of importance are SUB and the agency shop. You'll note that Ford locals are promising agency shops in plants located in states with right-to-work laws. Indiana has such a law and a similar provision may be granted at S-P. Regulations governing SUB payments may be changed too, since Indiana doesn't permit integrating SUB with State Unemployment Compensation. S-P's current funding position is low.

- Is it really a price cut?
- Can you meet it?
- If not, what can you do?

# You Can Rout the 'Thing'

THE WORDS "PRICE CUT" can throw fear into the heart of the strongest salesman. But such fears are often unfounded, says A. B. Lewis, president of Palmer-Donavin Mfg. Co., Columbus, Ohio, a distributor and manufacturer of home remodeling products.

The salesman faced with a customer who says, "I can get it cheaper from so and so," should first find out whether it really is a price cut he's dealing with, Mr. Lewis suggests in a talk prepared for the annual meeting of the National Association of Sheet Metal Distributors in Atlantic City, N. J.

"Perhaps you're not talking about the same thing," he explains. "The customer may not realize he's dealing with two different gages of galvanized sheet roofing, for instance."

Other suggestions for the salesman:

- Check quantities offered by the competitor.
- What is the quality? For example, a competitor often offers "wasters" or seconds whereas you are talking about prime galvanized sheets.
- What services does the competitor offer? Can you give better "extras"?
- Don't discount the possibility that your rival has made a mistake in calculating price. Or maybe you have, so get out the pencil and do some close figuring.
- Has transportation been added to the price?
- Don't let the customer be taken in by tricky rebates or cash discounts buried in the bid.
- "It is also important to take a look at the many types of suppliers we have to sell against on price," says Mr. Lewis, in referring to "pseudo-wholesalers" of all varieties. "My 12 salesmen are always sure to let their customers know the dangers of dealing with small or part time distributors that are not fully established and fully stocked and do not have a reputation for reliability." He adds: You may be up against a one shot distress sale of excess production.

• **Cut or Not to Cut**—Mr. Lewis poses this problem: Now, let's presume that you've thoroughly examined the facts behind your customer's statement that he can beat your offer elsewhere, and it's true. Can you or should you cut your price to get the business? Here's his approach:

First, you should be aware of the limitations and obligations imposed by the fair trade laws. Remember, if you offer a certain price or bonus extra to one dealer in a market, you have to make the same offer to his competitors that you serve.

He also feels that distributors must squarely face the fact that many dealers are simply more interested in price than in quality or other benefits. "But, still, you will find many who demand the branded, quality product at or near the price of the unknown stock and get it. This is particularly true for aluminum siding at the present time," the Columbus distributor reports.

"One instance in which we have to cut prices," asserts Mr. Lewis, "is to help the small dealer meet his local competition. I believe all distributors will agree that this is a major problem since both distributor and dealer are competing with large volume retailers."

He also suggests sacrificing full price on equipment to get the opportunity to sell supplies and accessories to the customer.

• **Crux**—Mr. Lewis urges managers and sales people to keep constantly in mind that: "Any concession from price comes right out of net profit." So how do you avoid selling on price alone, which can also damage the confidence and respect your steady customers have in your company?

These suggestions are made by Mr. Lewis:

- Know your competitors. Customers often don't have the time to examine all facets of various lines. Helping them do it can often spell the difference between success and failure out in the field.
- Press your advantage. Stress your exclusive brands and other things no competitor can duplicate. Encourage the dealer to carry larger stocks, even if it requires extended credit. That way, he can take advantage of lower quantity prices.
- Cut costs. Eliminate unprofitable sales and accounts whose service requirements eat up profits. Always be willing to admit that you can improve your efficiency, and thus pare costs by means of better equipment and methods and shrewder buying.

# How 'Giveaway' Selling Can Be Licked

CAN a company turn its back on price fighting, set its prices independently, and expect to survive? Line Material Industries, South Milwaukee, Wis., a division of McGraw-Edison Co., does.

Two years ago, LMI decided to stop selling electrical construction materials at a loss. Of the company's nine product lines, the construction material line was affected markedly by price fighting, and it was losing. In fact, it had not shown a profit since its inception in 1950.

LMI set out to halt the "giveaway selling" first by re-evaluating its prices. By early 1961, it was ready to implement its new policy: No profit, no sale. Result: During the April-June quarter of 1961, volume dropped, but operations of the line were profitable.

• **Price Fighting** — Cliff Petersen, product manager, says the electrical construction material industry has traditionally been beset by price instability. Over the years, prices have risen and fallen with little regard to costs. They have been determined by what the market would bear. Manufacturers have become the victims of their own efforts to cut prices and win sales. An example: In 1956, peak sales and greatest losses were recorded for LMI's line.

**Line Material Industries' two year, price re-evaluation program uncovered some startling examples of how far prices had drifted out of line . . .**

- **"We found a ⅜ in. machine bolt which we purchased black was selling 22 per cent below our cost from the supplier. After receiving this item, we applied galvanizing, crated, and shipped it. By re-evaluating our total costs, we increased the price 52 per cent. We had been losing 49 per cent.**
- **"A locknut purchased completely finished was reduced from $1.42 to 98 cents per hundred. The reduction was due solely to changing accounting procedures to reflect our true costs.**
- **"A heavy channel rack was lowered to $72.80 from $94.85 per hundred. In this case, it was found the item could be produced for less money at another plant. The basic cost was reduced 23 per cent."**

**Teaming up to pinpoint costs: Cliff Petersen (left), product manager, heads an analysis team in a detailed review of all costs affecting the price of a product**

"People have lost sight of what they should be getting for a product," says Rodgers G. Wheaton, LMI president. "Someone has to establish faith in prices."

• **Providing a Bench Mark**—Hoping to help the entire industry as well as his own company, Mr. Wheaton decided to provide a bench mark. To do so represented taking a step backward to get solid footing—selling for profit. To insure that each sale made in his line was profitable, Mr. Petersen decided that each product should be priced accurately, allowing a reasonable margin for profit. "We are no longer going to have one item subsidize another," he insisted.

• **Pricing Formula**—Before turning its back on price fighting, LMI had to bring its own prices into line with costs. The formula adopted: Realistic cost plus reasonable return equals net price.

In 1959, the company launched a major review of costs and prices of its electrical construction material line. For nearly two years, detailed studies were made to determine material, labor, equipment, tooling, shipping, engineering, research, and marketing costs for each product.

"Reasonable" profit margins were then added to costs to determine prices. The returns were specified margins for families of products based on the investment required to produce and sell that group. Margins varied according to investment and anticipated sales volume. The company found that some products could earn well on margins as low as 1 per cent.

LMI's price re-evaluation program was a big job. Since some 3000 products are sold and shipped to four zones in the U. S., 12,000 new prices had to be calculated for the construction material line. But the results justified the effort. Detailed, realistic cost figures and revised prices dramatically highlighted the areas where existing prices were unsound.

The studies pinpointed the products which were being sold at a loss—often substantial. They also showed which products were overpriced and could withstand considerable price trimming to make them more competitive. The chief factors necessitating price adjustments were warehousing and freight costs. For example, freight rates had gone up 9.5 per cent during the previous two year period but no adjustment had been made in prices. Important changes in labor, materials, and other costs had previously been overlooked too.

• **Profitability Increased** — LMI switched to its new sales policy for its electrical construction material line at the beginning of 1961. Since then, it has been passing up potential sales which would require taking a loss simply to get business. "Using this new philosophy, some volume has been lost," admits Cliff Petersen, but "profitability has increased."

He attributes the profitable operations during April-June to the new policy.

A new price list, reflecting the two year review of costs and prices, became effective July 1. Some prices have been raised, others cut. Differences between new and old prices range as high as 60 per cent. Mr. Petersen says the net effect of the over-all change is slightly downward—"perhaps 1 or 2 per cent." Despite the seemingly modest change, prices of individual products have been adjusted to insure that each covers cost and a reasonable profit.

When the price list was published, LMI sent a letter to its customers explaining the new formula, stating the reasons for the changes. "We sincerely feel that this is the only equitable way in which we can pay for the research necessary to provide tomorrow's construction materials and continue to offer you well engineered, high quality products at reasonable prices," the company stated.

• **Reactions**—Customer reaction has been surprisingly favorable, says the company. Mingled with the letters of praise have been only two complaints.

Some customers have expressed regret they cannot place orders on some items because they are priced higher than those of competitors. On this point, Mr. Petersen says, "If selling a particular item means we are going to lose money on it, we prefer the customer buy it from another manufacturer."

President Wheaton believes, "Reasonable customers don't expect you to sell at a loss." They realize that a supplier must make a profit to stay in business. And they want him to stay in business. They hurt themselves in the long run by bleeding their sources of supply or cramping a supplier's earnings so that he cannot invest in the development of better products.

• **An Advantage to Sell**—The most surprising reaction has taken the form of orders from firms with which the company had never done business. By basing prices on realistic costs, LMI was able to price some products below those of competitors.

Some buyers were quick to realize the advantage of being able to purchase selectively.

LMI says the electrical construction material industry is not accustomed to this practice. Buyers are in the habit of giving business to the manufacturer who quotes the lowest price. LMI's way of operating means a little more work for the buyer. But it's work that can pay off. Breaking a large blanket order into segments, he can shop around for the best price on each part to reduce his total cost.

• **Continuing Process**—Line Material Industries' price re-evaluation program has really just begun. To prevent prices from slipping out of line again, a constant watch is being maintained to spot any cost changes which would necessitate price increases or permit reductions. New standard price lists will be published at the end of each year and revisions will be made as often as necessary.

• **Team Analysis**—Another aspect of LMI's pricing procedure involves the use of analysis teams to reduce costs wherever possible. Headed by the product manager, groups of engineering, marketing, and production people single out products for study. They consider new design possibilities, different materials, and means of improving marketing techniques. Operating only since the start of the year, they have already made substantial improvements.

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service,* STEEL, *Penton Bldg., Cleveland 13, Ohio.*

# Machines Talk to Machines

**Data-Phone Series 400 transmits data (about 200 words per minute) by punched cards over the regular telephone network. Seen here are typical sending and receiving facilities. Sending set (right, front) is connected to an IBM card reader. Operator simply dials the connecting telephone call, then inserts punched cards into the business machine. At the receiving end (left, rear) the Data-Phone receiving set is mounted above an IBM Transceiver, which receives and reproduces the data in the form of identical punched cards**

A DEVICE which enables machines to talk with machines at speeds up to 1600 words per minute over regular telephone lines is said to hold as much promise for business and industry as the telephone.

The service, called Data-Phone, is offered by American Telephone & Telegraph Co. through the Bell Telephone operating companies. It's solving communication problems in accounting, administration, credit and collections, finance, insurance premiums, inventories, marketing, merchandising, payrolls, production purchasing, sales scheduling, and shipping.

One metalworking company—Jenkins Bros., a New York valve manufacturer—estimates it saves up to $50,000 a year via the service.

**• How It Works** — With Data-Phone, business machines can instantly receive, process, and store information transmitted from other machines. Connections are put through as simple telephone calls, explains Harvey J. McMains, administrator - data communications planning, Marketing Dept., AT&T.

Any type data in any machine language — including handwriting and diagrams—can be transmitted at low or high speeds, from any place in the country where a standard telephone is available. The setup is especially useful, says Mr. McMains in handling accounting and billing information, invoices, inventories, sales orders, payrolls, and other forms of business data.

Data-Phone sets receive information in the form of electrical pulses or "bits" from the originating machine and convert the pulses to tones suitable for telephone circuit transmission. At the receiving end, Data-Phone sets convert the tones back to electrical pulses which feed into business machines, teletypewriters, or other equipment.

The flexible system carries up to 1200 "bits" per second (Series 200), or roughly 1600 words per minute. It handles information from any medium—such as punched cards, paper or magnetic tapes. In the two and a half years since the introduction of Data-Phone, 1200 installations have been made. By year's end, 6000 sets are expected to be in use, Mr. McMains says. His forecast: Ten times that many will be in operation by 1965.

**• Potential** — The market outlook for manufacturers of data origination and transmission equipment that is compatible with Data-Phone could be $250 million a year by 1970, Mr. McMains told STEEL.

"I have seen estimates as high as $350 million, but none lower than $200 million," he adds.

As recently as four years ago, only three or four companies were producing input-output equipment to operate over communication channels.

Now, more than 50 business machine companies are developing products for use with communication based data processing, AT&T estimates.

William B. Quirk, Data-Phone marketing manager (a new marketing section was established to coordinate the new activity), emphasizes that the important first step is to help customers solve their present communication problems with present lines of equipment.

The sets function over private as well as regular telephone circuits. Customers can utilize and pay for as much or as little service as their business requires.

Charges for local or long distance calls are the same as those for ordinary telephone calls. In addition, there is a moderate monthly charge for the sets.

• **Optional Services** — Unattended operation is also possible. A long distance call can be made to an unattended set which automatically answers itself and connects the business machine. Once the call is made, machines complete the transmission of data unattended and hang up when the call has been completed.

Other benefits: Information can be stored during the day and transmitted at night, thus making it possible to take advantage of night rates on long distance calls.

• **Case Histories**—Banks, insurance companies, airlines, and chain stores have already discovered the advantages of the system. The Hardware Mutuals-Sentry Life insurance group has one of the largest installations of its kind—36 sets transmit data from the company's 34 branch offices to its data processing center in Stevens Point, Wis. Service to policyholders is speeded up, and operating costs are reduced by more than $1 million annually, the company reports.

Metalworkers are finding economies too. William J. Moody, manager, control order department, Jenkins Bros., says the company is achieving greater efficiencies and economies in inventory and ordering procedures.

"We can place an order with one or two of our warehouses and ship within 10 minutes," says Mr. Moody. "We eliminate the need to mail orders. Even with a regular telephone call, typing would have been necessary at the other end."

The chief cost of the service is in transmission fees, Mr. Moody points out. The company rents its equipment. "We're still getting plusses," says Mr. Moody, "and we plan to install a computer at our Bridgeport (Conn.) factory which will result in even greater savings."

• **Gives Assurance**—For Bethlehem Steel Co., Data-Phone installations "gives us assurance that what we send is correctly received," says H. V. Roumfort, manager of communication services (Bethlehem, Pa.). Biggest value: Order transmissions.

As AT&T points out: Data-Phone is designed to allow a customer to use his own computer equipment to better advantage. Around the corner are machines that will handle data still faster.

# Road Builders Project Metal Usage in Highways

FIGURES from the American Road Builders Association, Washington, show that highway construction and related uses will take up to 4 million tons of steel in 1961. Aluminum consumption for roads will hit an estimated 36.5 million lb.

Those estimates are based on the size of the program that can be financed under the Federal-Aid Highway Act of 1961 and other foreseeable financing.

The table below shows usage of metals by product category and projects metal consumption during the 1961-72 period.

| STEEL | TONS (In thousands) | |
|---|---|---|
| | 1961 | 1961-72 |
| Incorporated in Highways | | |
| Structural Steel | 1,068 | 14,140 |
| Reinforcing Steel | 1,100 | 14,540 |
| Steel Culvert Pipe | 259 | 3,380 |
| Concrete Pipe Reinforcement | 42 | 528 |
| Miscellaneous | 320 | 4,200 |
| Indirect Usage | | |
| Construction Machinery | 700 | 8,600 |
| Motor Vehicles | 300 | 3,750 |
| Repair Parts, Including Cutting Edges | 275 | 3,250 |
| TOTAL Steel | 4,064 | 52,388 |
| ALUMINUM | POUNDS (In thousands) | |
| Extruded Shapes & Tubes | 17,500 | 258,500 |
| Sheets & Plates | 14,300 | 211,600 |
| Castings | 3,400 | 50,300 |
| Wire | 700 | 10,400 |
| Rolled Shapes | 500 | 7,400 |
| Forgings | 100 | 1,800 |
| TOTAL Aluminum | 36,500 | 540,000 |

# Dillon O. K.'s Tax Reform Timetable

- Bulletin F revision for selected industries (now underway).
- Early in 1962, Congressional passage of the 8 per cent tax credit on new equipment investment.
- At the same time, passage of certain tax structure revisions to reduce revenue lost from the incentive credits.
- Later in 1962, broad recommendations to Congress for general tax reform.
- In 1963, consideration and passage of general reform.

WITH THE administration on the record with its plans for tax reform (see above), the outlook for passage of the 8 per cent tax incentive plan to modernize U. S. industry has improved, but passage next year is by no means guaranteed. Henry H. Fowler, undersecretary of the treasury, reports that the House Ways & Means Committee, which tentatively approved the program this year, will make it the first order of business when Congress reconvenes in January. Rep. Wilbur Mills (D., Ark.), chairman of the committee, and other Democrat members, appear ready to send the measure to the House floor as quickly as possible.

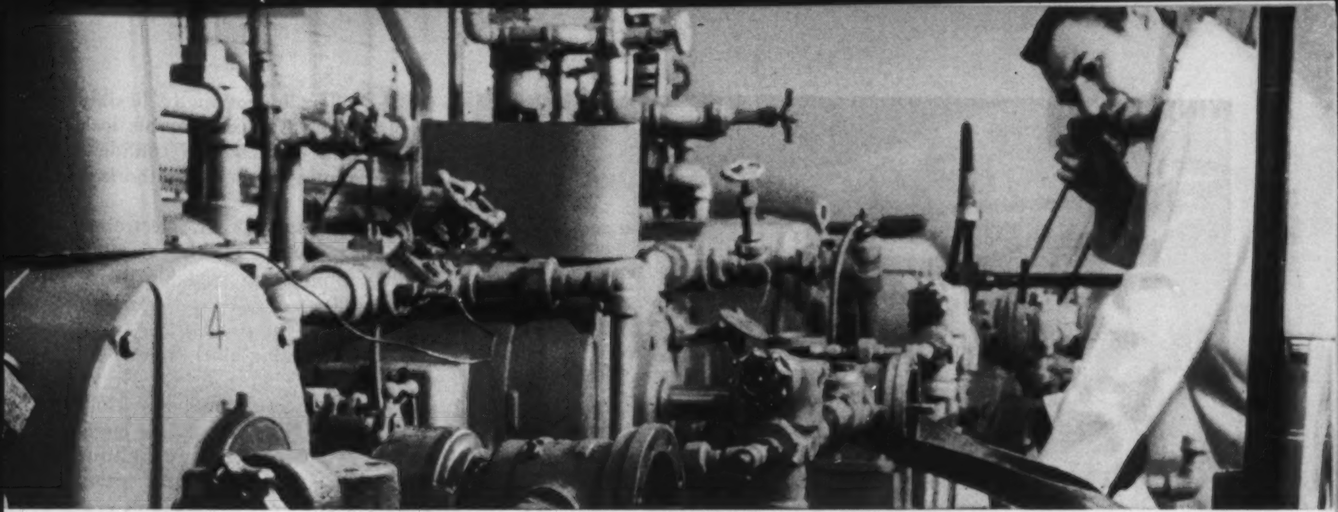
The first big roadblock is a committee fight over the compensating increases in other tax areas. Treasury Secretary Douglas Dillon wants to keep the cost of the incentive program down to $300 million or so. Areas include: 1. A withholding tax on interest and dividends. 2. Repeal of the dividend credit. 3. A tightening up of expense account deductions. 4. The withdrawal of the capital gains treatment on the sale of depreciable property to the extent that depreciation has been deducted in previous years. 5. Increased taxes on co-operative and other institutions. 6. Removal of some of the special privileges on foreign income of U. S. subsidiaries.

House passage does not, of course, guarantee Senate passage. Indeed, Sen. Harry F. Byrd (D., Va.), Finance Committee chairman, can be expected to hold long hearings on the incentive program—and finance committee approval will not guarantee passage on the Senate floor. The generally liberal group in the Senate can be counted on to respond to critics who decry the incentive as a special tax break for big business. Crux: Each step of the legislative process will be a "giant" one. And approval by the White House will not come if the revenue loss is not held to a minimum, says Mr. Fowler.

● **TEXTILE REVISION SETS PATTERN**—Speculation about where the President's revision of Bulletin F for textile machinery may lead: 1. Commerce Secretary Luther Hodges is due to make a report on transportation problems to Mr. Kennedy on Nov. 1. Certainly, his report will contain a recommendation that Bulletin F lives of railroad equipment be shortened. 2. Treasury sources say there has been no decision on what criteria will be used to gage any other industry's need for Bulletin F revision, but experts are trying to see "who is out of step" with the over-all economic growth patterns of U. S. industry. There remains the real possibility that Mr. Dillon will recommend an across the board revision of Bulletin F. At the least, it is likely that guidelines for Internal Revenue Service agents will be established for industries not widely recognized in Bulletin F schedules, such as electronics.

In the case of the decision to shorten the lives of textile equipment, treasury sources note that they "weighed the actual lives of the machinery," thus giving greater recognition to the obsolescence factor.

● **MORE REVISIONS EXPECTED**—Speaking on the "clear relationship" between declining U. S. expenditures on new equipment (as a percentage of gross national product) and increased competition from overseas, Secretary Dillon says the textile move is an "example of what can be expected from our over-all examination" of Bulletin F lives. "I am confident that many reductions of a significant nature will be possible" in other industries, although he notes the textile industry may be an extreme case.



**Listening for pump chatter.** Here—in Shell's Martinez, California, laboratory Shell Tellus hydraulic oils are subjected to the most demanding tests.

# BULLETIN:

## Shell presents a question-answer guide to help you select the hydraulic oils for top performance

**Selecting the proper hydraulic fluid for your equipment can be one of your most important decisions. And it can pay off in many ways. Less down-time. Longer equipment life. Lower cost per unit.**

**Here are six bench marks to help you pick the best hydraulic oil for your plant requirements.**

**1. Does it have good oxidation stability?** Oxidized hydraulic oil can form gums, lacquers and other deposits which may foul moving parts. Shell Tellus Oils are carefully refined to remove unstable, sludge-forming components—then fortified with a Shell-developed oxidation inhibitor.

**2. Will it resist foaming and emulsification?** Pump chatter and erratic operation are often the result of pump cavitation, brought on by oil foaming. Tellus® Oils contain additives to help prevent foaming.

**3. Does it fight rust and corrosion?** It is difficult to exclude all moisture from a hydraulic system. And moisture can form troublesome rust. Shell Tellus Oils have been carefully compounded to resist corrosion.

**4. What are its lubrication qualities in continuous service?** Shell Tellus Oils form a clinging, oily film on mating metal surfaces. This maintains a constant guard against wear.

**5. How does it react to temperature changes?** This is a key factor in the performance of hydraulic equipment. Careful selection of the proper viscosity grade of Tellus assures satisfactory operation of your system over its entire temperature range.

**6. Is it available in several viscosity grades?** Shell Tellus Oils are available in a broad range of viscosity grades. There's a special grade for virtually every hydraulic requirement.

Ask your Shell Industrial Products Representative for facts on Tellus Oils. Or write: Shell Oil Company, 50 West 50th St., New York 20, N. Y.

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**A message to manufacturers of hydraulic equipment**

There is a Shell Tellus Oil suited for your equipment.

**1.** Your customers can get Tellus Oils at Shell depots everywhere. Readily available throughout the world.

**2.** Quality is consistently high. Tellus always delivers top performance.

SHELL

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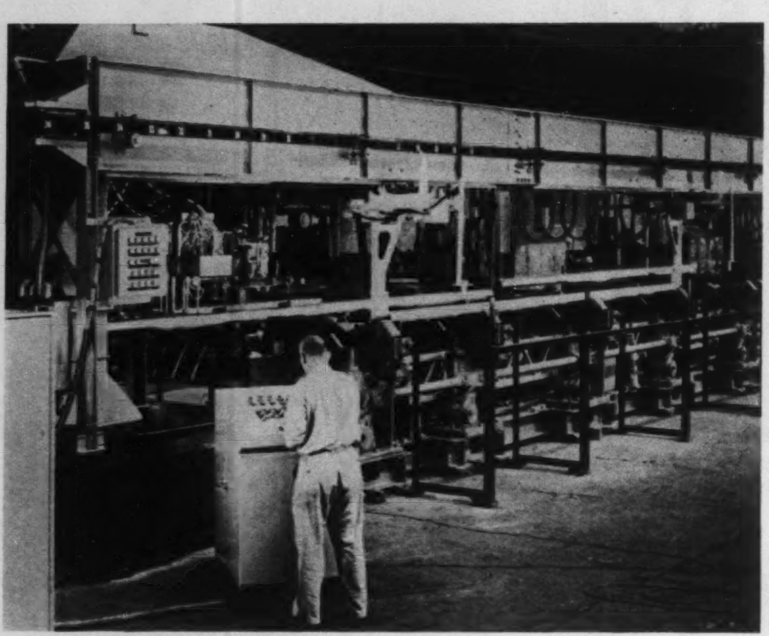
**A BULLETIN FROM SHELL**
**—where 1,997 scientists are working to provide better products for industry**



***New system handles the data as . . .***

# Pipe Mill Takes Key Step Toward 'Full' Automation

**• A MACHINE that automatically weighs, measures, identifies, and inspects pipe, then processes the data, is on its way to a major Midwestern steelmaker, report officials at Industrial Equipment Div., Eddystone, Pa., Baldwin-Lima-Hamilton Corp.**

Significance: It's another vital step toward the fully automatic pipe mill. Some immediate benefits:

- Metal loss is reduced by more accurate measuring and weighing. (Mills tend to overship to offset rejects.)
- Paperwork is completed faster, more accurately.
- Fewer operators are needed. One part time operator can replace four to eight employees—the number formerly required for weighing, measuring, tallying, and stenciling.
- Production not up to specification is rejected.

**• Pipes up to 50 ft long and 4.5 to 10.75 in. in diameter are measured for length within an inch limit, weighed to 0.1 per cent accuracy, and stenciled with weight, heat number, testing, and similar data. The machine makes a record of the measures, counts, and totals; computes weight per foot and if need be, the operator's bonus.**

The American Petroleum Institute (API) code requires that manufacturers stay within minus 3.5 per cent to plus 6.5 per cent of a given weight per foot. To play it safe, pipemakers lean toward the heavy side of those tolerances. One manufacturer estimates that a measuring system only 0.5 per cent closer to correct weight would save him $500,000 annually.

The B-L-H machine (nicknamed "Irene") can also sort pipe so that no more than 5 per cent short lengths are loaded into any one car (another API requirement).

**• The control setup (made by Telechrome Mfg. Corp., Amityville, N. Y.) offers exceptionally flexible accounting assistance. Double lock keys permit extraction of confidential accounting data by authorized personnel.**

B-L-H employs an electromechanical device which converts analog inputs into readable digits. To permit "remove and replace" maintenance, instrumentation is of modular, building-block-component design.

The system can't be operated unless a key is inserted. Each operator has his own key, thus permitting operator identification on the record of production.

Here is the machine sequence:

Pipes move from the hydrostatic test (just ahead of "Irene") to a series of transfer devices which place tubes one at a time for length measurement, weighing, and stenciling. Each pipe carries a legend of length, weight, manufacturer, diameter, weight per foot, and test pressure. Pipes are discharged to sorting tables.

During weighing and measuring, the computer immediately rejects pipe that doesn't meet API specifications. Programing is done by a simple set of buttons like those on an adding machine. Data like time, operator number, pipe count, length totals, grades, and heat are stored in the computer-control memory.

The automatic recorder provides up to nine printed copies of tabulated data so that it can be recorded on punched tape, punched cards, or magnetic tape.

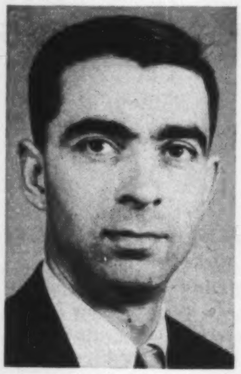
## $4 Million Navy Surplus Goes on Block Nov. 16

MORE THAN $4 million worth of surplus military equipment and supplies will be auctioned Nov. 16 by the Navy at Norfolk, Va.

Among the items to be sold: Metal balers, engine lathes, cylindrical grinders, spotwelding machines, 15 ton capacity gantry cranes, milling machines, nibbling machines, air compressors, pumps, gear shapers, bulldozers, and trucks.

Free catalogs detailing every article to be sold can be obtained by writing: Officer in Charge, U. S. Navy Consolidated Surplus Sales Office, Department T-14, Building 224, Naval Supply Center, Norfolk, Va.

***Consultant Spells Out . . .***



## Seven Important Marketing Trends

These seven developments of the last decade will accelerate in coming years and must be given attention by marketing management, says John P. Stevenson of Arthur D. Little Inc., Cambridge, Mass., management consulting firm . . . .

1. ADVANCING TECHNOLOGY—Look for more products, more complex products, shorter product lives, more competing models. Look for significant changes in distribution methods—more air freight, automatic warehousing, new packaging concepts, greater use of piggybacking. Look for progressive companies to revamp their reporting, ordering, and other communication systems to achieve greater speed in the mechanics of marketing. Look for more marketing managers to adopt advanced management techniques—such as operations research (in inventory control, pricing, measuring advertising effectiveness), and cash flow analysis.

2. THE AFFLUENT SOCIETY—The swing to marginal purchases will intensify. The consumer will continue to obtain a higher level of discretionary income. An important implication: Producers of consumer durable goods will have to compete more and more with nondurables and services.

3. THE BUYERS' MARKET—This exists in most industries today. It will continue. To counter it, companies will improve customer service and sell the fine distinctions between their products and those of competitors.

4. INTERNATIONAL COMPETITION—Nations can no longer afford to protect their industries behind high tariff walls. Manufacturers of all nations will attempt to open marketing doors in all other nations. To achieve real growth, U. S. firms must market outside this country.

5. SWING TO DIVERSIFICATION—The trend is toward greater consolidation in the marketing area, partly as the result of mergers and internal diversification. It means that marketing men must become acquainted with more products and more markets.

6. THE MARKETING CONCEPT—It has been given much lip service, but too few firms have really tried to make it work. Its advantages are many. It puts a business management point of view into the sales function. It integrates all the areas of marketing into one effective package. It can make a true manager out of the volume-oriented marketer.

7. THE PROFIT SQUEEZE—We've made significant progress in production techniques. Now the bulk of the profit squeeze results from increasing costs in the distribution and sales functions. Management must adopt more approaches to improve marketing efficiency.

# Market for Profit Growth . . . No. 2

PROFIT GROWTH

COSTS, competition, complexity, and change. The intensification of those four Cs is forcing marketing management to find new ways to reach two Es—efficiency and effectiveness.

As a manufacturer, you can divide your entire operation into three parts—creating the product, making the product, and marketing the product. If you examine the efficiency of each area, odds are that marketing will come in last.

That's understandable. You've probably placed more emphasis on cutting costs and improving productivity in your production operations than you have in your marketing operations. But the time has come, when the emphasis of top management must be placed on improving marketing productivity.

Listen to what Edward J. Green, vice president-planning and marketing, Westinghouse Air Brake Co., told the American Marketing Association's annual conference: "More than 75 years ago, the 'better mousetrap' theory of marketing became obsolete. More than 50 years ago, the general store began to fade away, followed by the corner grocery. More than 30 years ago, a marketing revolution started in intangibles, spread to consumer goods, and now the pent up force is breaking on industrial marketing. Our whole economy is feeling the full brunt of the revolu-

DCA
DELIVERY
WAREHOUSING
BILLING

## The Case for Distribution Cost Analysis

"THE REDUCTION in unit costs and increase in efficiency from the use of distribution cost analysis may be even greater than (the gains) attained as a result of the pioneer work in time and motion studies and cost accounting in the factory."

That conclusion was reached by the American Marketing Association's Committee on Distribution Costs & Efficiency. The concept demands investigation by more metalworking firms that are burdened today, more than ever before, by a distribution system that is complicated, increasingly costly, and often inefficient.

• **What It Is**—Distribution cost analysis is a method of determining the costs of specific marketing activities and the costs and profits of various segments of the business—specific products or product groups, specific markets, classes of customers, or units of sale. It involves the assembly of distribution costs into meaningful classifications and then comparing them with alternative expenditures and related sales volumes and profit margins to discover the most effective marketing methods.

• **How It Is Used**—Distribution cost analysis (DCA) has four principal uses:

1. To determine the kinds and amounts of expense incurred in each separate marketing activity—such as outside selling, billing, warehousing, delivery. This opens the door to the pinpointing of responsibilities, to the tracing of the reasons for increased costs, and to the development of standard costs where feasible.

2. To evaluate marketing methods, policies, and operating procedures. DCA provides the basic data for appraising the value of services (such as credit or delivery), methods of sale (such as by telephone, mail, or direct), and company performance vs. the use of outside organizations (for transportation, warehousing). It sharpens judgments as to when and where agents, distributors, or other middlemen might be more economical than direct sales.

3. To determine the marketing cost and profitability of specific products or customers. This information can lead to a switch in emphasis on various markets or customers, to changes in product mix, to the introduction of new products, and other such improvements.

4. To determine the relationship between cost and order size—as a basis for diminishing losses on small orders and as an approach to establishing quantity discounts conforming to the Robinson-Patman Act.

• **Conclusion**—Summarizes the AMA committee: "The methods of distribution cost analysis have been developed to the point where most major problems in the field can be soundly approached. As further research is completed, new and improved methods will undoubtedly be developed. Methodology, however, is no longer a factor that seriously restricts expansion of the field."

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tionary changes. To withstand this impact, management must apply its resources more effectively toward the accomplishment of optimum objectives. To help achieve the goal, marketing must: 1. Provide adequate decision making data. 2. Formulate strategy and tactics responsive to domestic and world markets. 3. Innovate at a much faster rate in products and marketing services. 4. Develop marketing men who can and will carry the marketing programs to a successful and profitable conclusion. The challenge of leadership is the willingness and ability to face facts, accept their implications, and take appropriate action."

Mr. Green has hurled the challenge. How to meet it? Here are some approaches, tools, and techniques being used successfully . . .

• **Market Research**—Though giant steps have been made in the refinement of the research tools and in the acceptance by top management of the need for market research, far too many firms are still not doing a satisfactory job of determining what their customers need. Asserts Mr. Green: "The average capital goods company has such an accumulated deficit in the areas of marketing research that its profitable survival is threatened."

• **Distribution**—A. E. Cascino, vice president - marketing, International Minerals & Chemical Corp., told a National Industrial Conference Board group that "distribution is the last frontier of industrial waste and inefficiency."

He points out that, in most companies, "the functions of physical distribution are divided up in an illogical, nonworkable manner between manufacturing and sales. Fragments of the total effort are usually assigned to executives of equal status, who use their respective portions to foster their own

# The Case for 'Systems Marketing'

SYSTEMS
MARKETING
ADVERTISING
PACKAGING
MARKETING
DISTRIBUTION

MARKETING has grown so complex, costly, and competitive that more and more firms are tending toward a marketing approach akin to systems engineering. The move is being made because managers recognize the inherent ineffectiveness of considering each element of the marketing effort separately from the other elements.

Lippincott & Margulies Inc., a New York industrial design firm that has long favored the systems approach, points out: "Under systems marketing, the product concept *and* the name selection *and* the package *and* the advertising *and* the distribution plan *and* the merchandising *and* the product publicity—*and* everything else connected with the product—are considered not as separate problems but as elements of a total marketing plan or system."

There's a fairly good reason for that approach. Today's consumer is bombarded with around 1500 sales messages between waking and sleeping. So he has surrounded himself with a shell of sophisticated indifference. It's tough to break through the shell and reach him, tougher still to sell him, and extremely difficult to win his lasting loyalty.

Systems marketing helps. It utilizes all the methods and media of selling to focus a single sales impression. Says Lippincott & Margulies: "This concentration of impression, based firmly on product, market, and design research, is the marketer's best assurance of breaking through the 'noise' of all the other competing communications and registering his sales message on the mind of the customer."

Among good reasons to consider using the systems marketing approach:

1. The pace of new product introduction is rapid and still accelerating. The introduction process cries for greater efficiency. Systems marketing helps by supplying the approach and the tools to determine what marketing needs will exist at some future time.

2. The number of factors that influence product success is increasing. Systems marketing demands the use of a "feedback circuit" that helps to sense these new factors, so that you can exploit them.

3. The cost of communicating a sales message to the ultimate consumer has increased much faster than corporate profits, reports Lippincott & Margulies. So it becomes ever more important to get maximum impact per dollar. The systems marketing approach helps to do that.

4. Systems marketing is an aid to the creative individual. Like systems engineering, it starts with one prime target—the objective of the product. From there, no holds are barred. The creative spirit has maximum latitude.

Says Lippincott & Margulies: "At times, a slapdash, unco-ordinated, sales program will achieve success—usually for reasons that have nothing to do with its marketing plan. But increasingly, we suspect, the pressures of costs and competition will force all manufacturers to seek new roads to sales. Systems marketing, we are convinced, represents the best and surest way to this goal."

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vested and primary interests—at the expense of efficiency. Even worse, some of the important functions are overlooked, creating areas devoid of purpose and organization."

Mr. Cascino urges management "to recognize that physical distribution is a single, integrated, and coordinated whole that must be administered by one person."

- **Sales Incentives**—George D. Butler, vice president-marketing, International Resistance Co., Philadelphia, told the Conference Board group that a new incentive earnings plan for salesmen was "a very significant factor" in IRC's sales expansion from less than $14 million in 1958 to almost $21 million in 1960. The plan gives the direct salesman his base salary for up to 90 per cent of his selling quota. In addition, it provides a graded series of personal incentive bonuses for those achieving more than 90 per cent of quota, as well as additional contributions to a district office "pool." Distribution of the pool is based on performance evaluation by the district manager and national sales manager.

- **Customer Orientation** — International Business Machines Corp. offers a prime example of customer

## PLAN FOR PROFIT GROWTH

### Selling to Government for Profit Growth

**On Nov. 6, STEEL will discuss the special marketing problems involved in selling to federal, state, and local governments. For a free copy of any or all articles in this series (appearing biweekly since Jan. 16) write: Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.**

# The Case for the Product Manager

AT KOPPERS CO. INC., the product manager is "as much a part of our marketing as hot dogs are part of the American way of life," asserts Joseph L. Tunstead, vice president and director of marketing.

He told a National Industrial Conference Board marketing conference that Koppers has 27 people called product managers and "about 12 or 15 more who operate as product managers but under different titles." Each has charge of a group of related products or services. Each is, in reality, the marketing manager for his product line.

Mr. Tunstead says: "Today's problem of successful entry into the market place where there is more and more product competition makes the use of product managers even more important than ever before." He lists seven modern facts of marketing life that work in favor of a product manager setup:

1. The need for extending more and more technical service.

2. The need for greater sensitivity to constantly changing customer needs.

3. Intense competition.

4. The threat of obsolescence.

5. The problem of multiproduct salesmen giving insufficient attention to certain products.

6. The problems involved in successfully launching new products.

7. The need for more selectivity in the selling effort—the need for customer analysis to determine how much emphasis to place on each customer.

"Without the specialization inherent in the product manager function, many of these problems would be glossed over, possibly with unacceptable results," warns Mr. Tunstead.

What is a product manager? At Koppers, he is the "recognized leader of all marketing activity on his product and has authority in dealing with technical development and market development. He also has authority in dealing with production and technical service. He is the one who gets action on all phases of his particular assignment."

Take a product manager in the firm's Plastics Div. Six product managers report to the manager of sales. District sales managers also report to the manager of sales, but they take their functional direction from the product manager insofar as a particular product group is concerned.

Product managers in the Plastics Div. work together as a team in developing total markets for plastics and in serving customer requirements.

The product manager determines types and quantities of products required to meet sales expectations. He estimates the levels of inventories needed (but does not exercise any direct authority over production). He establishes the marketing objectives for his line and the policies or methods for their attainment. Planning—of product line growth and profit as well as sales—is one of his functions. He spends a large part of his time with customers and the field sales force. (That direct contact, plus the flow of reports from salesmen, servicemen, customers, and district managers makes the product manager "customer oriented.") He can call upon the corporate market research staff for help, and he is encouraged to participate in industry association activities.

The product manager recommends in such areas as pricing, discounts, terms of sale, merchandising, and allocation of merchandising expense. He co-ordinates field efforts among districts and, through analysis, assures adequate and efficient sales coverage. He makes a running analysis of opportunities and problems for his product line. Says Mr. Tunstead: "I cannot emphasize this phase of the product manager's job too much because the assembly of information, analysis, and establishment of objectives, policies, and plans are the heart of our marketing system."

The product manager concept is an especially successful approach in the introduction of new products. Example: Dylite, a new expandable polystyrene with a fascinating set of physical properties, was given to the product manager in charge of polystyrene when the new item came out of the development lab. But the item didn't really get off the ground because it was getting only part-time attention. So Koppers appointed a product manager to devote all his time to Dylite. The item began its move—out of the knickknack field into industrial and commercial markets where it is finding its greatest usefulness. Mr. Tunstead attributes the new product's success largely to the efforts of the product manager, who, he says, "changed this product venture from mediocrity and possible failure to one of Koppers' most successful product promotions in the market place."

---

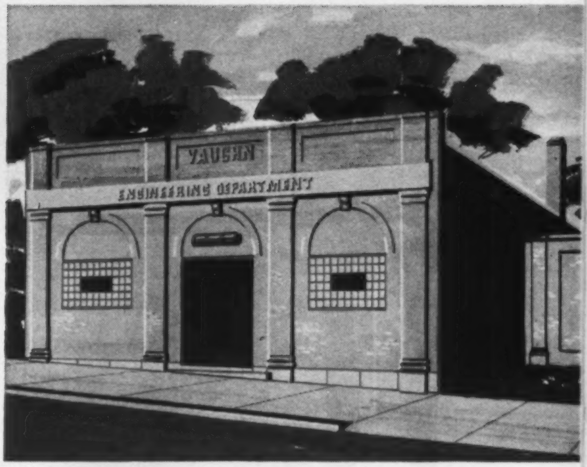
oriented planning that pays off. Example: The firm's "business laboratory" approach. Under it, an IBM representative—without sales responsibility—is assigned to "live with" a customer. His job is to study the customer's operations and suggest improvements. It does, of course, lead to the sale of IBM equipment in many cases where it will solve the customer's problems.

• **Product Manager** — In a functionally organized, multiproduct company, each department is primarily interested and involved in its own functions as they relate to the product. Says E. L. Kuryloski, vice president - marketing, Merck, Sharp & Dohme, division of Merck & Co. Inc.: "It is necessary for someone to co-ordinate all these various activities for maximum marketing efficiency."

the PAST . . .

PRESENT

and FUTURE



of **BETTER COLD DRAWING** for Industry

Modern cold drawing began in fact with the introduction of the Vaughn Motobloc in 1924—a great surge forward in the pace of Vaughn mechanical development that started with our first rod frame in 1871.

The Motobloc was followed by the Motoblox, and progress has accelerated steadily with ever-faster and more productive models to the present day, included in the world's only complete line of cold drawing equipment.

Tomorrow is on the drawing boards at Vaughn, with methods and machines that in their time will change again the thinking of an industry. That future is clearly defined by the accomplishments of four generations of continuous Vaughn leadership and the invaluable contributions of progressive wire, bar and tube manufacturers.

*Let us work with you on your coming production requirements.*

**The VAUGHN MACHINERY COMPANY**

**CUYAHOGA FALLS, OHIO**

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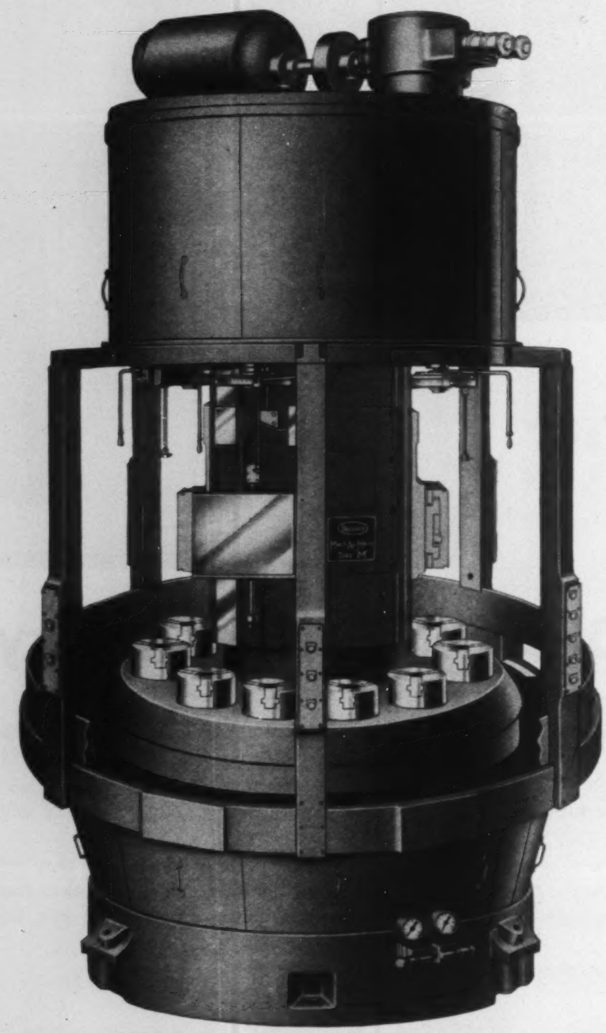

## with the NEW Bullard Mult-Au-Matic Type "M"

To achieve the same production output obtainable from a Bullard Mult-Au-Matic, Type "M", competitive methods would require a greater investment of capital funds.

Built to exacting Bullard standards, the Type "M", available with 6, 8, or 12 spindles, incorporates in its design many features which insures its rigidity, accuracy, and productivity, even on difficult machining jobs.

For complete Mult-Au-Matic, Type "M" information, write for a catalog or call your nearest Bullard Sales Office or Distributor.

**The Bullard Company, Bridgeport 9, Conn.**

# THE PRICE IS LOWER!

### *Ford vice president spells out . . .*

# Steps to Manufacturing Flexibility

"NO ONE can afford the luxury of excess capacity. We must build into our existing and future product lines a sufficient degree of mobility so they can be rapidly and economically converted or expanded to meet volume fluctuations in any of the cars we build."

So says Charles H. Patterson, vice president of Ford Motor Co.'s basic manufacturing group. He emphasizes that changing customer demands have led to a broader variety of models. Demand is shifting so rapidly, he says, that it's no longer possible to accurately predict what share of the market any one type of car may obtain. Result: "We must minimize the number of nonessential differences in the products and maximize the interchangeability of the machines and tools used to make them."

## U. S. Auto Output

**Passenger Only**

| | 1961 | 1960 |
|---|---|---|
| January | 415,857 | 688,690 |
| February | 364,385 | 659,298 |
| March | 407,959 | 654,241 |
| April | 446,739 | 582,869 |
| May | 542,303 | 611,260 |
| June | 599,474 | 613,136 |
| July | 399,191 | 434,377 |
| August | 195,266 | 305,514 |
| September | 354,491 | 407,691 |
| 9 Mo. Totals | 3,725,665 | 4,957,076 |
| October | ...... | 617,972 |
| November | ...... | 597,638 |
| December | ...... | 523,422 |
| Total | ...... | 6,696,108 |
| **Week Ended** | **1961** | **1960** |
| Sept. 16 | 64,164 | 85,879 |
| Sept. 23 | 73,034 | 120,722 |
| Sept. 30 | 114,551 | 134,118 |
| Oct. 7 | 102,098 | 140,832 |
| Oct. 14 | 97,329† | 144,056 |
| Oct. 21 | 115,000* | 146,339 |

Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.

- **More Basic Bodies**—If you'll look at the body dimensions and engine specifications of the cars listed on the next page and compare them with 1958 cars (STEEL, Nov. 18, 1957, p. 123), you'll find that more of today's models are sharing the same bodies and basic engines.

Equally important changes are being made in manufacturing equipment. Suppliers may as well face up to the fact that single purpose machines are rapidly vanishing from the automotive scene.

Says Mr. Patterson: "We are investing more of our money in redesign of equipment instead of putting it all into the design of the product alone." Ford already has made the recently formulated machine tool standards (the building block concept) a company requirement. Result: It now can vary the production requirements between its 144 and 170 cu in., six cylinder engines by 250,000 units a year if customers show a sudden preference for one engine over another.

CHARLES H. PATTERSON

Like its competitors, Ford is rebuilding assembly lines so they can handle unitized and frame-body cars on the same facilities. There's no longer any need to set up a separate plant for each type of car. Its foundries already are making use of composite patterns and mold boxes which can be adapted to a variety of castings. Cupolas are designed for casting any one of several types of iron, ranging from gray to malleable or nodular. And if you're still wondering about Ford's position toward aluminum engine blocks, Mr. Patterson told the Detroit chapter of the American Foundry Society: "I can't see aluminum engine blocks at the moment because of cost. If you can show me how to make them as cheaply as iron blocks I might buy them, but I doubt it."

- **Press Line Specs**—Although Mr. Patterson doesn't say this, it's also true that Ford is grouping all the major press lines in its stamping plants according to size and number of presses in each line. It's setting them up with standard specifications, spacing, and handling equipment. Result: Any part assigned to a particular press line design group can be run in similar lines in any of the company's facilities.

(*Please turn to Page* 54)

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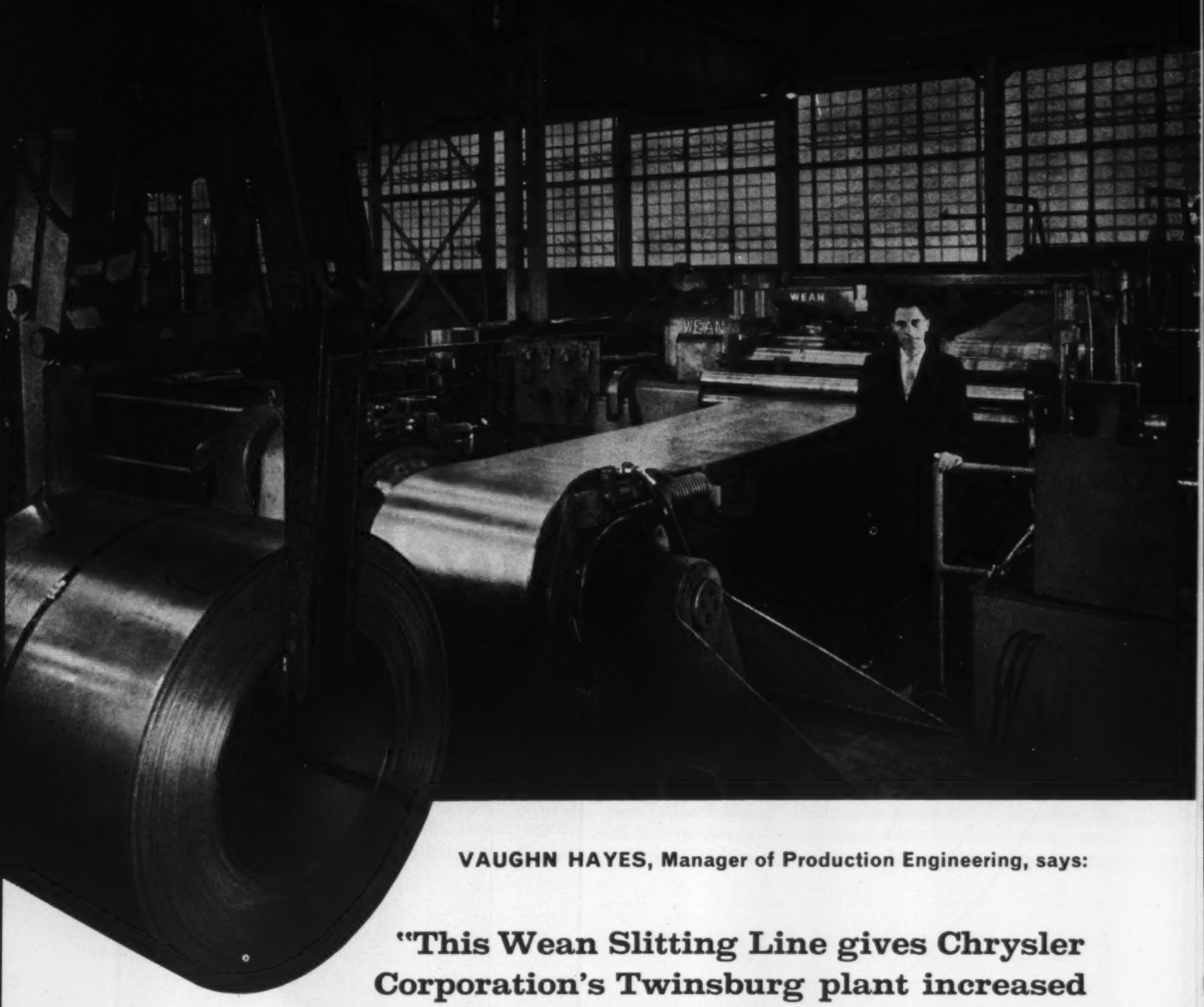
# 1962—Price Line Held on Most Models

| | DIMENSIONS (Based on 4 door sedans) | | | | | ENGINES* | | | | ACCESSORY PRICES‡ | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Make | Price | Wheelbase (Inches) | Length (Inches) | Height (Inches) | Shipping Weight (Pounds) | Type | Bhp/rpm | Displacement (Cubic Inches) | Comp. Ratio | Auto. Trans. | Power Steering | Power Brakes | Radio |
| **CHEVROLET** | | | | | | | | | | | | | |
| Corvair 700 | $2,111 | 108 | 180 | 51.5 | 2,370 | 6 Al-Horiz. | 80/4,400 | 145 | 8.0:1 | $156.60 | N/A | N/A | $47.90 |
| Chevy II-100 | 2,041 | 110 | 183 | 55.5 | 2,545 | 4 in-line | 90/4,000 | 153 | 8.5:1 | 167.40 | $75.35 | $43.05 | 56.50 |
| Biscayne | 2,378 | 119 | 209.6 | 55.5 | 3,450 | 6 in-line | 135/4,000 | 235.5 | 8.25:1 | 188.30 | 75.35 | 43.05 | 47.90 |
| Bel Air | 2,617 | 119 | 209.6 | 55.5 | 3,455 | V-8 | 170/4,200 | 283 | 8.5:1 | 199.10 | 75.35 | 43.05 | 56.50 |
| Impala | 2,769 | 119 | 209.6 | 55.5 | 3,490 | V-8 | 250/4,400 | 327 | 10.5:1 | 199.10 | 75.35 | 43.05 | 56.50 |
| Corvette† | 4,038 | 102 | 176.7 | 52.1 | 2,905 | V-8 | 360/6,000 | 327 | 11.25:1 | 199.10 | N/A | N/A | 137.75 |
| **PONTIAC** | | | | | | | | | | | | | |
| Tempest | 2,240 | 112 | 189.3 | 53.6 | 2,816 | 4 in-line | 110/3,800 | 195 | 8.6:1 | 172.80 | 75.32 | N/A | 53.80 |
| Catalina | 2,796 | 120 | 211.6 | 55.9 | 3,749 | V-8 | 215/3.600 | 389 | 8.6:1 | 231.34 | 107.50 | 43.00 | 88.77 |
| Star Chief | 3,097 | 123 | 218.6 | 55.9 | 3,865 | V-8 | 283/4,400 | 389 | 10.25:1 | 231.34 | 107.50 | 43.00 | 118.52 |
| Bonneville† | 3,425 | 123 | 218.6 | 55.9 | 3,933 | V-8 | 303/4,600 | 389 | 10.25:1 | 231.34 | 107.50 | 43.00 | 124.82 |
| **OLDSMOBILE** | | | | | | | | | | | | | |
| F-85 | 2,457 | 112 | 188.2 | 52.7 | 2,598 | V-8 Al | 155/4.800 | 215 | 8.75:1 | 189.00 | 86.08 | N/A | 65.64 |
| Dynamic 88 | 2,997 | 123 | 213.9 | 55.8 | 4,031 | V-8 | 280/4,400 | 394 | 10.25:1 | 231.34 | 107.50 | 48.11 | 88.77 |
| Super 88 | 3,273 | 123 | 213.9 | 55.8 | 4,057 | V-8 | 330/4.600 | 394 | 10.25:1 | 231.34 | 107.50 | 48.11 | 88.77 |
| Series 98 | 3,984 | 126 | 220 | 56.6 | 4,261 | V-8 | 330/4,600 | 394 | 10.25:1 | Std | Std | Std | 124.82 |
| **BUICK** | | | | | | | | | | | | | |
| Special | 2,358 | 112 | 188.4 | 52.8 | 2,666 | V-6 | 135/4,600 | 198 | 8.8:1 | 189.00 | 86.08 | 42.50 | 65.64 |
| Le Sabre | 3,227 | 123 | 214.1 | 56.3 | 4,104 | V-8 | 280/4.400 | 401 | 10.25:1 | Std | 107.50 | 43.00 | 90.30 |
| Invicta† | 3,667 | 123 | 214.1 | 56.3 | 4,159 | V-8 | 325/4.400 | 401 | 10.25:1 | Std | 107.50 | 43.00 | 90.30 |
| Electra 225 | 4,051 | 126 | 220.1 | 57.0 | 4,304 | V-8 | 325/4,400 | 401 | 10.25:1 | Std | Std | Std | 152.92 |
| **CADILLAC** | | | | | | | | | | | | | |
| Sixty-Two† | 5,213 | 129.5 | 222 | 56.3 | 4,640 | V-8 | 325/4.800 | 390 | 10.5:1 | Std | Std | Std | 164.60 |
| Sixty-Special† | 6,366 | 129.5 | 222 | 56.6 | 4,710 | V-8 | 325/4.800 | 390 | 10.5:1 | Std | Std | Std | 164.60 |
| Seventy-Five | 9,722 | 149.8 | 242.3 | 59.1 | 5,325 | V-8 | 325/4,800 | 390 | 10.5:1 | Std | Std | Std | 246.60 |
| **FORD** | | | | | | | | | | | | | |
| Falcon | 2,047 | 109.5 | 181.1 | 54.5 | 2,299 | 6 in-line | 85/4.200 | 144 | 8.7:1 | 163.10 | N/A | N/A | 58.50 |
| Fairlane | N/A | 115.5 | 197.6 | 55.5 | 2,791 | 6 in-line | 101/4 400 | 170 | 8.7:1 | Prices not released at presstime. | | | |
| Galaxie | 2,507 | 119 | 209.3 | 54.8 | 3,684 | 6 in-line | 138/4.200 | 223 | 8.4:1 | 179.80 | 81.70 | 43.20 | 58.50 |
| Galaxie 500 | 2,776 | 119 | 209.3 | 54.8 | 3,679 | V-8 | 170/4.200 | 292 | 8.8:1 | 189.60 | 81.70 | 43.20 | 58.50 |
| Thunderbird† | 4,321 | 113 | 205 | 53.5 | 4,132 | V-8 | 300/4,600 | 390 | 9.6:1 | Std | Std | Std | 112.80 |
| **MERCURY** | | | | | | | | | | | | | |
| Comet | 2,139 | 114 | 194.8 | 54.5 | 2,437 | 6 in-line | 85/4,200 | 144 | 8.7:1 | 171.70 | N/A | N/A | 58.50 |
| Meteor | N/A | 116.5 | 203.8 | 55.8 | 2,816 | 6 in-line | 101/4.400 | 170 | 8.7:1 | Prices not released at presstime. | | | |
| Monterey | 2,835 | 120 | 215.5 | 54.9 | 3,714 | V-8 | 170/4,200 | 292 | 8.8:1 | 189.60 | 81.70 | 43.20 | 58.50 |
| **LINCOLN** | | | | | | | | | | | | | |
| Continental | 6,074 | 123 | 213 | 53.7 | 4,929 | V-8 | 300/4,000 | 430 | 10.0:1 | Std | Std | Std | Std |
| **PLYMOUTH** | | | | | | | | | | | | | |
| Valiant V-100 | 1,991 | 106.5 | 184.2 | 53.4 | 2,520 | 6-30 deg. | 101/4,400 | 170 | 8.2:1 | 171.55 | 73.00 | 40.60 | 58.50 |
| Savoy | 2,262 | 116 | 202 | 54.0 | 3,165 | 6-30 deg. | 145/4 000 | 225 | 8.2:1 | 191.80 | 76.60 | 42.60 | 58.50 |
| Belvedere | 2,506 | 116 | 202 | 54.0 | 3,175 | V-8 | 230/4.400 | 318 | 9.0:1 | 210.70 | 76.60 | 42.60 | 58.50 |
| Fury | 2,670 | 116 | 202 | 54.0 | 3,180 | V-8 | 305/4,800 | 361 | 9.0:1 | 210.70 | 76.60 | 42.60 | 84.30 |
| **DODGE** | | | | | | | | | | | | | |
| Lancer 170 | 2,011 | 106.5 | 188.8 | 53.4 | 2,535 | 6-30 deg. | 101/4,400 | 170 | 8.2:1 | 171.55 | 73.00 | 40.60 | 58.50 |
| Dart | 2,297 | 116 | 202 | 54.0 | 3,010 | 6-30 deg. | 145/4.000 | 225 | 8.2:1 | 191.80 | 76.60 | 42.60 | 58.50 |
| Polara 500† | 3,019 | 116 | 202 | 54.0 | 3,300 | V-8 | 305/4,800 | 361 | 9.0:1 | 191.80 | 76.60 | 42.60 | 58.50 |
| **CHRYSLER** | | | | | | | | | | | | | |
| Newport | 2,964 | 122 | 214.9 | 55.2 | 3,720 | V-8 | 265/4,400 | 361 | 9.0:1 | 226.90 | 107.60 | 47.80 | 92.80 |
| 300 Series† | 3,400 | 122 | 214.9 | 55.2 | 3,810 | V-8 | 305/4,600 | 383 | 10.0:1 | 226.90 | 107.60 | 47.80 | 92.80 |
| New Yorker | 4,125 | 126 | 219.3 | 55.4 | 3,950 | V-8 | 380/4,600 | 413 | 10.1:1 | Std | Std | Std | 129.40 |
| Imperial Custom† | 5,106 | 129 | 227.1 | 56.8 | 4,805 | V-8 | 340/4,600 | 413 | 10.0:1 | Std | Std | Std | Std |
| **RAMBLER** | | | | | | | | | | | | | |
| American De Luxe | 1,895 | 100 | 173.1 | 56.1 | 2,500 | 6-L | 90/3,800 | 195 | 8.0:1 | 164.85[1] | 74.20 | 39.95 | 58.50 |
| Classic Custom | 2,150 | 108 | 190 | 57.5 | 2,940 | 6 in-line | 127/4,200 | 195.6 | 8.7:1 | 186.50 | 74.20 | 41.95 | 64.95 |
| Ambassador 400 | 2,605 | 108 | 190 | 57.5 | 3,275 | V-8 | 250/4,700 | 327 | 8.7:1 | 219.50 | 81.20 | 43.95 | 64.95 |
| **STUDEBAKER** | | | | | | | | | | | | | |
| De Luxe Lark | 2,040 | 113 | 188 | 56.5 | 2,760 | 6 in-line | 112/4,500 | 170 | 8.25:1 | 171.82 | 77.23 | 42.47 | 56.64 |
| Regal Lark | 2,190 | 113 | 188 | 56.5 | 2,770 | 6 in-line | 112/4,500 | 170 | 8.25:1 | 171.82 | 77.23 | 42.47 | 58.89 |
| Daytona Lark† | 2,308 | 109 | 184 | 56.5 | 2,765 | 6 in-line | 112/4,500 | 170 | 8.25:1 | 171.82 | 77.23 | 42.47 | 64.47 |
| Lark Cruiser | 2,628 | 113 | 188 | 56.5 | 3,030 | V-8 | 180/4,500 | 259.2 | 8.5:1 | 199.50 | 77.23 | 42.47 | 69.41 |
| Hawk† | N/A | 120.5 | 204 | 55.5 | 3,230 | V-8 | 210/4,500 | 289 | 8.5:1 | 199.50 | 77.23 | 42.47 | 69.41 |

---

†Hardtops. *A variety of engines is shown for each division. ‡Some optional prices are shown. Heaters are standard on all Ford and GM cars. They cost $78 on Larks, $76 on Ramblers, and $74.40 to $136.30 on Chrysler lines. 1. Price for "E-Stick" transmission is $59.50. n/a = Not available. Prices include federal excise tax and suggested dealer preparation charges. They do not include state and local taxes and transportation costs.



**VAUGHN HAYES**, Manager of Production Engineering, says:

## "This Wean Slitting Line gives Chrysler Corporation's Twinsburg plant increased flexibility in production planning

by allowing us to purchase standard size mill coils. We slit these coils to meet specific production requirements, eliminating special-width coil purchases. The line's 2,000 ton-per-month output helps us eliminate production delays and coil supply problems." Mr. Hayes' comments are typical of reasons why companies are using the *coil processing concept* to lower material costs, reduce inventory requirements and decrease scrap loss. If you process 500 tons or more per month of flat rolled metals, write for our new brochure entitled, "Coil Processing."

This brochure explains the concept and economics involved in *coil processing*. It also illustrates the types of Wean equipment that can help you cut inventory, production, and material costs when you process standard *mill* coils instead of sheets.

*The McKay Machine Company, Youngstown 1, Ohio.*

The McKay Machine Company is licensed to manufacture, sell and service metal processing machinery formerly manufactured by Wean Equipment Corporation, Cleveland, Ohio.

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of receiving your order for Timken® 52100 steel tubing, we will have the shipment on its way. You can get fast service like this on less than mill quantities because we stock 101 sizes—from 1″ O.D. to 10½″ O.D.—in our modern warehouse. And you can get the same fast service on 50 sizes of 4620 tubing. To save time and money, keep in mind that 90% of all your structural parts can be made from one or the other of these two steel analyses. For full details, call or write for our book "Alloy Steel Mechanical Tubing Stock List", The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable: "TIMROSCO". Makers of Tapered Roller Bearings, Fine Alloy Steel and Removable Rock Bits.

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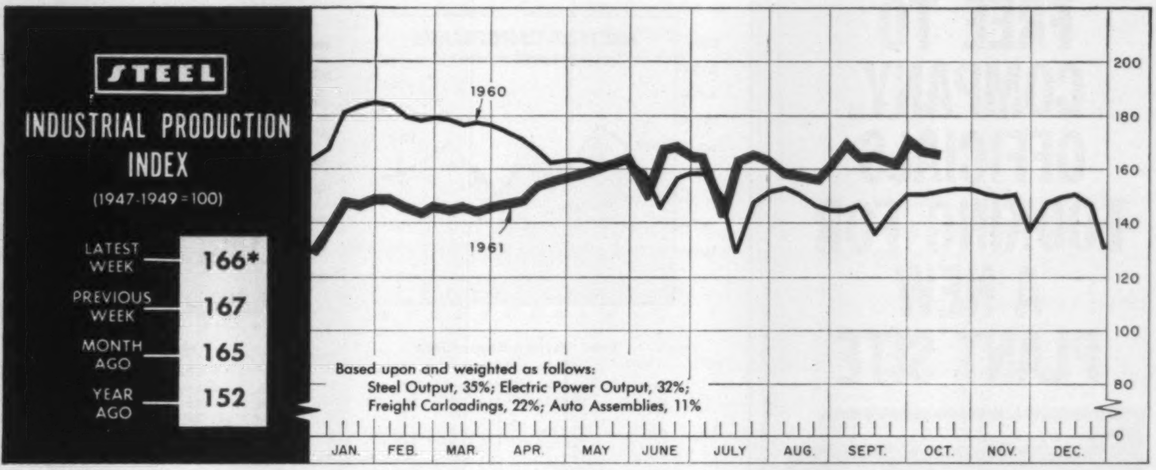
*Fine Alloy* **STEEL**



*Week ended Oct. 14.

# Business Recovery Reaching Maturity

DON'T BE MISLED by the government's report that industrial production in September declined a point to 112 (1957 = 100). The recovery is not over. It is maturing.

The economic truism that one month does not constitute a trend is worth repeating. It might even be stated that two months of decline or stability will not constitute a trend at this time because of the unusual circumstances which are causing the break in the rapid recovery. As stated in this column last week, the labor unrest in the auto industry may hold the Federal Reserve Board's industrial production index in check this month, especially if Chrysler is struck.

**• New Strength Ahead** — While there is little doubt that a certain amount of caution has been injected into the business outlook by the auto strikes, it should be noted that at least two of the more disturbing aspects of the upturn are being corrected: 1. The consumer apparently is shaking off a strong recession complex. 2. The unevenness of the recovery is smoothing out as more and more areas of the nation come under the influence of the upturn.

Unless the sign posts are all wrong, those two developments should combine with rising government expenditures, improved capital goods spending, heavy construction activity, and an apparent increase of interest in new autos to bring renewed vigor to the economy next month and well into 1962.

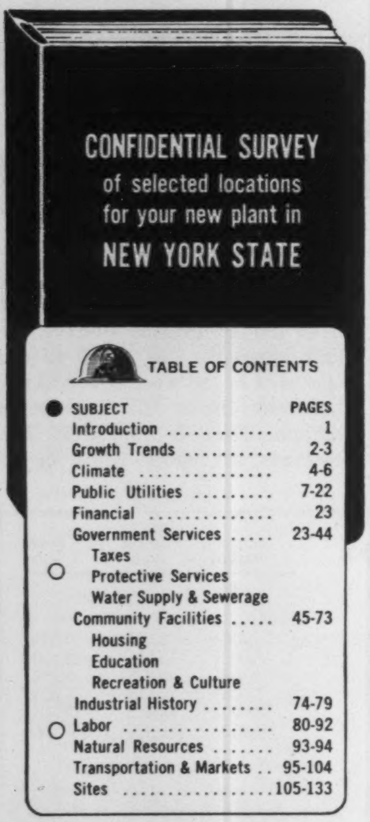
**• Effects Spread** — For the third consecutive week, the Federal Reserve Board reports that department store sales are ahead of those in the year ago week. And the margin is growing—it has moved from no change in the week ended Sept. 16 (8 of the 12 Federal Reserve districts lagged the 1960 pace) to plus 6 per cent in the week ended Oct. 7 (only one district still lagged). In addition, Dun & Bradstreet Inc. continues to report gains in its

## BAROMETERS OF BUSINESS

| | LATEST PERIOD* | PRIOR WEEK | YEAR AGO |
|---|---|---|---|
| **INDUSTRY** | | | |
| Steel Ingot Production (1000 net tons) | 2,050[1] | 2,071 | 1,579 |
| Electric Power Distributed (million kw-hr) | 15,000[1] | 15,035 | 14,120 |
| Bituminous Coal Output (1000 tons) | 8,600[1] | 8,775 | 8,279 |
| Crude Oil Production (daily avg—1000 bbl) | 7,050[1] | 7,112 | 6,824 |
| Construction Volume (*ENR*—millions) | $388.9 | $450.5 | $444.5 |
| Auto, Truck Output—U. S., Canada (*Ward's*) | 120,418[1] | 126,953 | 167,470 |
| **TRADE** | | | |
| Freight Carloadings (1000 cars) | 645[1] | 640 | 653 |
| Intercity Truck Tonnage (changes from year ago) | +4.2% | +3.3% | +0.7% |
| Business Failures (Dun & Bradstreet) | 300 | 286 | 343 |
| Currency in Circulation (millions)[2] | $32,600[1] | $32,673 | $32,276 |
| Dept. Store Sales (changes from year ago)[2] | +6% | +5% | +2% |
| **FINANCE** | | | |
| Bank Clearings (Dun & Bradstreet, millions) | $27,027 | $29,859 | $22,104 |
| Federal Gross Debt (billions) | $293.6 | $293.7 | $288.1 |
| Bond Volume, NYSE (millions) | $29.8 | $27.4 | $21.5 |
| Stocks Sales, NYSE (thousands of shares) | 16,173 | 16,241 | 10,967 |
| Loans & Investments (billions, adjusted)[3] | $116.2 | $117.1 | $105.9 |
| U. S. Govt. Obligations Held (billions)[3] | $33.6 | $34.4 | $27.5 |
| **PRICES** | | | |
| STEEL's Finished Steel Price Index[4] | 247.82 | 247.82 | 247.82 |
| STEEL's Nonferrous Metal Price Index[5] | 225.2 | 224.8 | 222.2 |
| All Commodities[6] | 118.5 | 118.5 | 119.2 |
| Commodities Other than Farm & Foods[6] | 127.0 | 127.0 | 127.7 |

*Dates on request. [1] Preliminary. [2] Federal Reserve Board. [3] Member Banks, Federal Reserve System. [4] 1935-39=100. [5] 1936-39=100. [6] Bureau of Labor Statistics Index, 1947-49=100.

FREE TO COMPANY OFFICIALS LOOKING FOR A NEW PLANT SITE



CONFIDENTIAL SURVEY
of selected locations
for your new plant in
NEW YORK STATE

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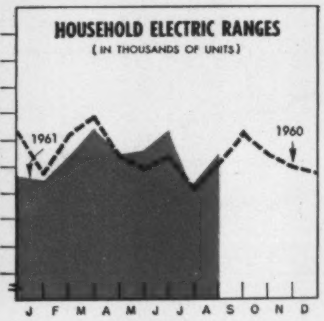
**TAILOR-MADE REPORTS.** The table of contents shown above is typical of the survey of selected plant locations that we will prepare for your organization. Simply send your specific requirements on your business letterhead to Commissioner Keith S. McHugh, New York State Department of Commerce, Room 4107, 112 State Street, Albany 7, N. Y.

Keith S. McHugh

Keith S. McHugh, Commissioner
New York State Department of Commerce

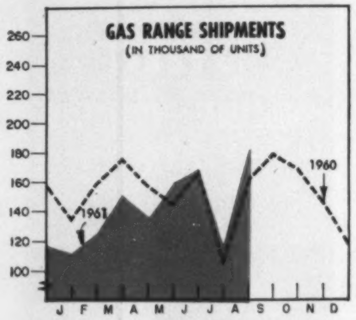
## THE BUSINESS TREND



Total Factory Sales—Units

| | 1961 | 1960 | 1959 |
|---|---|---|---|
| Jan. .. | 109.400 | 116.000 | 120.800 |
| Feb. .. | 128,100 | 144.500 | 131.600 |
| Mar. .. | 148,200 | 157.700 | 172.600 |
| Apr. .. | 128,400 | 127,900 | 136.100 |
| May .. | 131.600 | 118.500 | 133.400 |
| June .. | 145,000 | 127.200 | 151,400 |
| July .. | 104,000 | 102.900 | 129.200 |
| Aug. .. | 127,500 | 123,400 | 116 600 |
| Sept. .. | ...... | 144.000 | 157.200 |
| Oct. .. | ...... | 129,100 | 143.400 |
| Nov. .. | ...... | 119,400 | 144.000 |
| Dec. .. | ...... | 114,400 | 147,500 |
| Totals . | ...... | 1,525,000 | 1.686,800 |

National Electrical Mfrs. Assn.
Charts copyright, 1961, STEEL.



Shipments—Units

| | 1961 | 1960 | 1959 |
|---|---|---|---|
| Jan. .. | 114,800 | 133,400 | 148,700 |
| Feb. .. | 121.800 | 159.300 | 152,400 |
| Mar. .. | 150.800 | 174,800 | 171,300 |
| Apr. .. | 136.000 | 156.500 | 165,800 |
| May .. | 161.500 | 145.500 | 160.400 |
| June .. | 167.200 | 166.500 | 171.000 |
| July .. | 114.400 | 105,700 | 143,800 |
| Aug. .. | 182,900* | 162.800 | 176.400 |
| Sept. .. | ...... | 178,600 | 210,500 |
| Oct. .. | ...... | 169.000 | 195.000 |
| Nov. .. | ...... | 144,400 | 159.900 |
| Dec. .. | ...... | 117,800 | 157,100 |
| Totals . | ...... | 1,814,300 | 2,012,300 |

*Preliminary.
Gas Appliance Mfrs. Assn.

weekly survey of retail sales.

The Department of Labor reports that in September employment conditions improved in two-thirds of the 150 major areas regularly surveyed. Thirteen areas moved from the substantial unemployment status to that of moderate unemployment, leaving only 72 areas with unemployment ranging above 6 per cent of the work force. The recession high of 101 occurred last March and April.

Reports from around the country confirm the feeling that conditions in general are getting better.

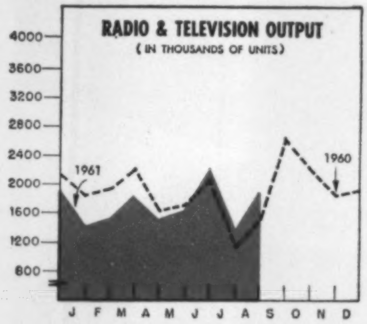
- **Chicago**—The September report of the Purchasing Agents Association of Chicago indicates that the recovery is still in progress, although at a slightly slower pace than in earlier months. Deliveries are lengthening, and prices are firm. Some inventory building is taking place. Slight weakening in new orders and production may have resulted from the automotive strikes. The profit picture is improving.

- **Syracuse, N. Y.**—Nine out of ten reporting members of the Purchasing Agents Association of Syracuse and Central New York look for employment to remain the same or improve over the next 90 days. That compares with 8 out of 10 so reporting a month earlier.

- **Milwaukee**—The Milwaukee Association of Commerce states that the latest business indicators "point more clearly to rising prosperity" than they have at any other time this year. Bank debits are rising; increasing reports by the Credit Bureau indicate renewed interest in consumer buying; the workweek is 40.4 hours; and department store sales are rising monthly. Milwaukee was one of the slower moving areas in the spring.

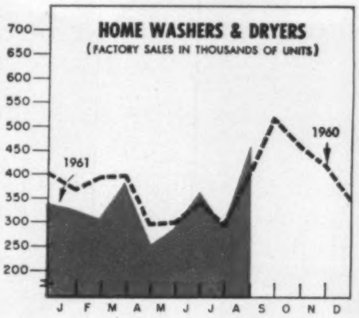
- **Cincinnati** — The Cincinnati branch of the Federal Reserve Bank of Cleveland reports that nearly all the business barometers are pointing to better conditions. Unemployment is steadily declining; electric power is rising; department store sales are ahead of the year-ago pace (also ahead of the pace for the Fourth Federal Reserve District as a whole); auto registrations are climbing; and repossessions are declining; construction is gaining.

- **Buffalo**—This area, like Milwaukee, was a slow mover in the early stage of the recovery, but now it is



| | Radio | | Television | |
|---|---|---|---|---|
| | 1961 | 1960 | 1961 | 1960 |
| Jan. .. | 1.090 | 1.356 | 368 | 526 |
| Feb. .. | 1,115 | 1.442 | 444 | 503 |
| Mar. .. | 1,384 | 1.668 | 497 | 550 |
| Apr. .. | 1,125 | 1.230 | 406 | 423 |
| May .. | 1,197 | 1.277 | 470 | 442 |
| June .. | 1,626 | 1.551 | 615 | 519 |
| July .. | 1,030 | 890 | 383 | 269 |
| Aug. .. | 1,385 | 1.048 | 515 | 462 |
| Sept. .. | .... | 1.915 | ... | 679 |
| Oct. .. | .... | 1.728 | ... | 500 |
| Nov. .. | .... | 1.469 | ... | 430 |
| Dec. .. | .... | 1.522 | ... | 405 |
| Totals . | .... | 17,126 | ... | 5,708 |

Electronic Industries Association.



| | Washers | | Dryers | |
|---|---|---|---|---|
| | 1961 | 1960 | 1961 | 1960 |
| Jan. | 228.919 | 254.565 | 103.158 | 111.603 |
| Feb. | 227.562 | 283.640 | 81.310 | 108.367 |
| Mar. | 305.590 | 305.635 | 82.093 | 90.205 |
| Apr. | 209.695 | 235.828 | 46.042 | 53.213 |
| May | 247.904 | 243.913 | 42.672 | 53.700 |
| June | 301.295 | 276.955 | 60.705 | 61.950 |
| July | 228,422 | 217.655 | 64.923 | 72.580 |
| Aug. | 332,562 | 296.499 | 122,346 | 105,119 |
| Sept. | ...... | 352.700 | ...... | 165.500 |
| Oct. | ...... | 305.800 | ...... | 151.900 |
| Nov. | ...... | 275.300 | ...... | 142.000 |
| Dec. | ...... | 223.500 | ...... | 119.200 |
| Totals | ..... | 3,272,020 | ...... | 1,238,318 |

American Home Laundry Mfrs. Assn.

showing substantial progress. The purchasing agents in the Niagara Frontier say that prices are inching upward; inventories are advancing; and employment is rising. Lead-times for capital goods are stretching out—90 days to six months or more.

- **Pittsburgh**—While business conditions in the Steel City have been stymied somewhat by the auto strikes, the weekly index of business activity compiled by the University of Pittsburgh has moved from about 90 per cent of the 1947-49 level to 103 per cent (week ended Oct. 7) since the second quarter.

- **Cleveland** — This metalworking center is the largest of the 13 areas removed from the Labor Department's list of substantial unemployment. The latest report shows unemployment at 5.6 per cent of the civilian labor force. The auto strikes have put a temporary damper on the area's economy, but the longer term outlook is improving.

While most of the reports are similar to those above, a few strike a note of caution. Examples:

- **Minnesota** — Conditions in the Ninth Federal Reserve District have been hampered by serious drought and reduced activity in the Mesabi iron ore range. While personal income in the district gained 2.8 per cent in the latest period, it was far behind the 4.2 per cent gain in total U. S. personal income. (If the farm sector is excluded, personal income showed a more comparable gain of 4.1 per cent.) The employment gain between July and November is expected to be only 5500 workers, much smaller than the gains in comparable recovery periods.

- **Southern California**—While business conditions have been in the ascendancy nearly all year, it should be noted that the index of business activity compiled by Security First National Bank of Los Angeles leveled off in August. "Available evidence indicates that a consolidation of recent gains is occurring, rather than an actual change in the upward trend."

- **Southeast**—"The pace of economic recovery in the Sixth Federal Reserve District has been somewhat disappointing, at least to those optimists who expect every month to be better than the last," declares the Federal Reserve Bank of Atlanta.

COSTS UP?

MACHINES TIED DOWN?

Plant moves, rearranging layouts, new machine installations all cost money — and the cost *is* excessive if you make a practice of lagging your production equipment to the floor.

Wouldn't it save money in your operation if you could forget about spotting, drilling, shimming, lagging and all the other costly necessities that go with tying down machinery? By using BARRYMOUNTS® you eliminate those expenses *and* repeat your savings whenever you relocate a machine.

Barry offers *three* different resilient elements: neoprene, helical springs or air to solve your individual requirements. These quality-engineered Machinery Mounts not only provide the ultimate in layout flexibility — they pay big dividends too — isolating shock and vibration, improving precision, reducing machine and building maintenance. Even operator efficiency goes up as noise levels come down.

If you want to add cost-saving efficiency to your operation — look into a BARRYMOUNT® program. Write for Bulletin 60-04C, "Practical Considerations When Installing Machinery."

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SHOCK • VIBRATION • MACHINE EFFICIENCY
Division of Barry Wright Corporation BW
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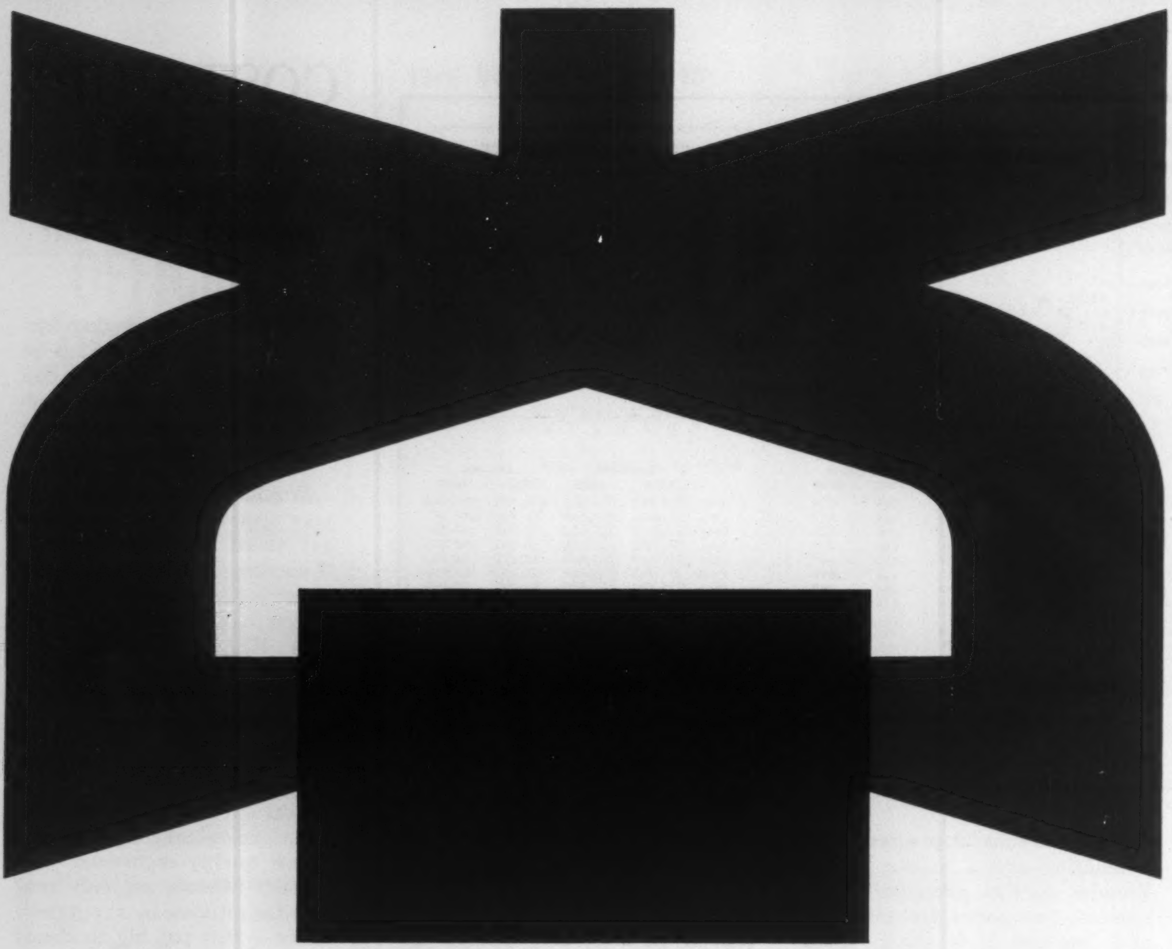
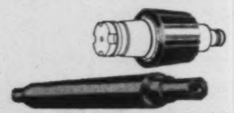


# Heppenstall rolls it, cuts it, handles it



Back-up roll sleeves and forged hardened, ground rolls

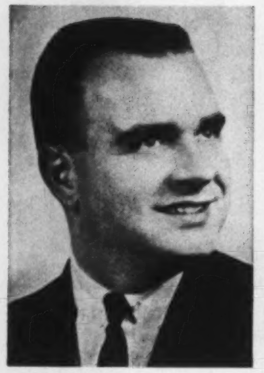
Slab shear knives

Scissors-type ingot tongs

Heppenstall Representatives are thoroughly experienced in the selection and application of our back-up roll sleeves and rolls, knives and tongs — from melt shop to finished product. Their know-how, gained in plant after plant, is always available to help you solve problems and improve efficiency in steelmaking operations. In each product division, modern laboratories are carrying on intensive research programs — for the improvement of present products and the development of new ones. For service or specific information, contact your nearest Heppenstall Representative or write us direct.

**HEPPENSTALL COMPANY**
PITTSBURGH 1, PA.
Plants: Pittsburgh & New Brighton, Pa. • Bridgeport, Conn.

**MIDVALE-HEPPENSTALL COMPANY**
NICETOWN, PHILADELPHIA 40, PA.



ARTHUR J. MUELLER
*Mueller Industries president*

WARD B. BROWNING Jr.
*Armco Div. chief eng.*

ORRIN BERTHIAUME
*Kollsman plant gen. mgr.*

W. K. GINMAN
*Natco div. sales mgr.*

**Arthur J. Mueller** was named president, **Mueller Industries Inc.**, Milwaukee, and is headquartered at the company's Love Bros.-Pyott Foundry Div. Mueller has centralized its operations in Milwaukee.

**Ward B. Browning Jr.** was named chief engineer, **Armco Div.**, Middletown, Ohio, Armco Steel Corp. He succeeds **John B. Whitlock,** retired.

**Frederick B. Beardsley** was elected president and treasurer, **Waterbury Rolling Mills Inc.**, Waterbury, Conn. **Gordon W. Somers** was elected chairman.

**A. D. Fentzke** was made product manager, technical sales for the Refractories Div., New York, of **Babcock & Wilcox Co.**

**Edward L. Asch** was made operations manager, International Div., **Vickers Inc.**, Detroit, division of Sperry Rand Corp.

**Orrin Berthiaume** was named general manager of the Elmhurst, N. Y., plant of **Kollsman Instrument Corp.**, division of Standard Kollsman Industries. He was production manager at Cannon Electric Co., Los Angeles.

**M. E. Carroll**, former executive vice president, was elected president of **Clinton Engines Corp.**, Maquoketa, Iowa.

**Donald E. Brichta** was made purchasing manager, Power Train Group, **Chrysler Corp.**, Detroit.

**David A. Jamieson** was named purchasing agent of **Reynolds Metals Co.'s** Listerhill, Ala., reduction plant. He succeeds **Basil Horsfield Jr.**, now purchasing agent for the adjoining alloys plant.

**Frank L. Brandt** was appointed vice president, Lynn, Mass., Div. **Thomson Electric Welder Co. Inc.** He will direct the company's new marketing program.

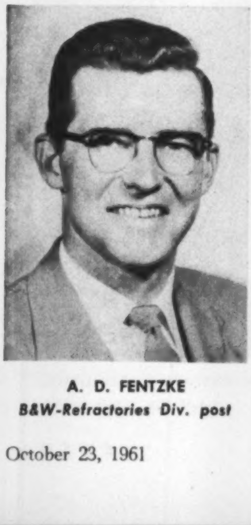
**W. K. Ginman** was appointed sales manager, Induction Heating Equipment Div., **National Automatic Tool Co. Inc.**, Richmond, Ind. He was Detroit district manager for Tocco.

**George F. Schuning** was named general sales manager, **J. O. Ross Engineering Div.**, New York, Midland-Ross Corp.

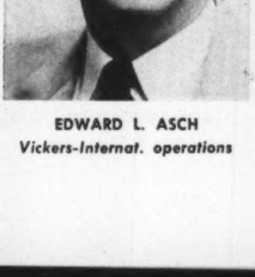
**Richard W. Martini** was made assistant chief metallurgist, **Misco Precision Casting Co.**, Whitehall, Mich., division of Howe Sound Co. He was with Sivyer Steel Casting Co.

**John T. Fisher** joined **Schacht Steel Construction Inc.**, Hillside, N. J., as vice president. He was formerly an executive with Ingalls Iron Works Co., and chairman of Allied Building Metal Industries.

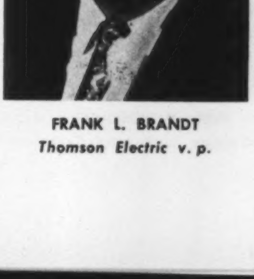
**L. P. Struble Jr.** was elected a vice president of **Dravo Corp.**, Pittsburgh, replacing **R. W. Marvin**, resigned because of ill health. Mr. Struble was also made general man-



A. D. FENTZKE
*B&W-Refractories Div. post*

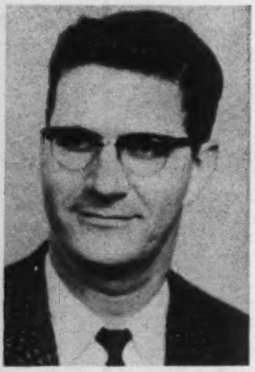


EDWARD L. ASCH
*Vickers-Internat. operations*



FRANK L. BRANDT
*Thomson Electric v. p.*

L. P. STRUBLE JR.
*Dravo vice president*



DR. MERTON M. BECKWITH PAUL R. STUART

*R. O. Hull & Co. promotions*

WILLIAM J. HUNT RICHARD B. QUINN

*Riverside-Alloy products managers*

ager of the firm's Engineering Works Div.

**Dr. Merton M. Beckwith** was named vice president and technical director of **R. O. Hull & Co. Inc.**, Cleveland. **Paul R. Stuart** was made vice president and general manager. **Walter Friede** was named manager, customer service laboratory.

**Soule Steel Co.**, San Francisco, named **Craig C. Carpenter** to the new post of general manager, Reinforcing Steel Div.

**Dr. George T. Murray** was named vice president-research, **Materials Research Corp.**, Yonkers, N. Y.

**Julio J. Usera** joined the International Div. of **Hooker Chemical Corp.**, New York, as director of sales.

**Ernest L. Gerdts** was appointed production and development engineer of **Volkert Stampings Inc.**, Queens Village, N. Y.

**Riverside-Alloy Metal Div.**, Riverside, N. J., H. K. Porter Company Inc., named as product managers **William J. Hunt** for nickel alloys; **Richard B. Quinn** for copper alloys.

**Wayne Pump Co.**, Ft. Wayne, Ind., industrial division of Symington Wayne Corp., named **Stanley E. Hess** assistant general manager. He was works manager for Lynch Corp.

**James E. Brown** was named president of **California Steel & Tube**, Los Angeles, succeeding **Philip P. Brown**, who continues as chairman.

**Fred W. Hoover Jr.** joined **Continental Can Co.**, New York, as assistant to the president.

**Robert A. Luntz** was elected president, **Luntz Iron & Steel Co.**, Canton, Ohio. **Stanton Luntz** was elected chairman. **Theodore M. Luntz** and **Edward Hollander Sr.** were elected vice presidents. **A. M. Luntz**, former president, continues as principal executive officer, and is now chairman of the executive committee and treasurer.

**A. D. Murray** was named vice president-manufacturing, **Altamil Corp.**, Indianapolis. He is a former president of Zenite Metal Corp. **Andrew M. Mitchell** was made general manager, **Aluminum Forge Co.**, division at Santa Ana, Calif. He was plant manager at Youngstown Steel Car Corp.

**James Kuse** was named director of market development by **Hodag Chemical Corp.**, Skokie, Ill. He was with the Silicones Div. of Union Carbide Corp.

**John C. Kingsbury** was made executive vice president, **Nash Bros. Co.**, Evanston, Ill. He resigned from Johns-Manville Perlite Corp., where he was vice president-operations.

**Edward J. Doolittle** was appointed product sales manager, cutting and forming equipment, for **Baldwin-Lima-Hamilton Corp.'s** Industrial Equipment Div. at Eddystone, Pa.

ERNEST L. GERDTS

*Volkert Stampings post*

FRED W. HOOVER Jr.

*joins Continental Can*

ROBERT A. LUNTZ

*Luntz Iron & Steel pres.*

EDWARD J. DOOLITTLE

*B-L-H div. sales post*

**W. H. Rowand** was named vice president in charge of **Babcock & Wilcox Co.'s** new Marketing Dept. established within its Boiler Div., Barberton, Ohio. He is succeeded as head of the Engineering Dept. by **G. W. Kessler,** former chief engineer.

**Leon Levitt** was named to the new post of director of corporate planning, **Monogram Precision Industries Inc.,** Culver City, Calif. He was public relations manager with Telecomputing Corp.

**Joseph J. Meder** was named manager of the new Government Marketing Div. of **Acme Steel Co.** He has headquarters in the general offices at Riverdale, Ill.

**LeRoy J. Stoutenburg** was made sales manager, **Kline Mfg. Co.,** Galena, Ohio, subsidiary of Cooper-Bessemer Corp. He was sales manager, Hydraulics Div., American Engineering Co., now a subsidiary of Aircraft Armaments Inc.

**Dr. Stanley Hills** joined **Electric Storage Battery Co.,** Philadelphia, and was appointed to the staff of the Industrial Group. He will carry out research and development projects.

**Jack M. Cudlip** was named manager of product development at **McLouth Steel Corp.,** Detroit. **Alex S. Simmons** was made manager of district office sales.

**G. Harvey Porter** was made director of marketing services, **Black & Decker Mfg. Co.,** Towson, Md., to succeed **J. H. Schmidt Jr.,** recently made general sales manager, Consumer Products Div.

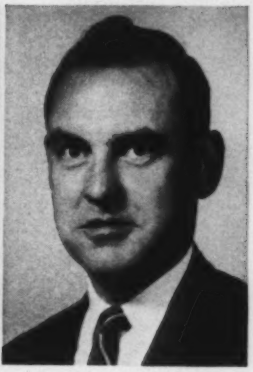
**Arthur J. Raymo** was made director of manufacturing, Kansas City, Mo., Div., **Bendix Corp.,** to succeed **H. E. Williams,** acting factory manager, who returns to California in his former capacity as West Coast representative of the division. The division is operated by Bendix for the Atomic Energy Commission.

**Phillip J. Liston** was named sales manager, **Fibercast Co.,** Sand Springs, Okla., division of Youngstown Sheet & Tube Co.

**John E. Brinkmann** was made general superintendent, Electrical Departments, **Allis-Chalmers Mfg. Co.'s** West Allis, Wis., Works Industries Group.

W. H. ROWAND
*B&W-Boiler Div. marketing*

LEON LEVITT
*Monogram Precision exec.*


JOSEPH J. MEDER
*Acme Steel Div. mgr.*

LeROY J. STOUTENBURG
*joins Kline Mfg.*

RICHARD B. MALAND
*Merit Export president*

ARTHUR T. ALLEN
*Solar Steel mill supt.*

**Richard B. Maland,** general sales manager of Di-Acro Corp., Lake City, Minn., resigned that post to become president and general manager of the newly formed **Merit Export Corp.,** combination export and export management firm.

**E. H. Peterson** was elected president and chief executive officer of **Magnus Chemical Co. Inc.,** Garwood, N. J. **W. M. Campbell,** founder and former chairman and president, continues as chairman.

**William G. Kancian** was promoted to assistant works manager of **American Motors Corp.'s** Milwaukee body plant. He succeeds **E. G. Trester,** who becomes director of quality there.

**Donald J. Wallace,** vice president-manufacturing, **Wheel Trueing Tool Co.,** Detroit, was advanced to vice president-sales for the Detroit Tool Sales Div. He is assisted by **Arthur J. Baehr,** promoted to sales manager of the division. **James E. Slanaker** succeeds Mr. Baehr as sales representative in the Cleveland area.

**Arthur T. Allen** was named mill superintendent of the Precision Strip Mill Div., River Rouge, Mich., **Solar Steel Corp.** He was acting general foreman of Republic Steel Corp.'s Strip Steel Dept. at Warren, Ohio.

**James M. Klivans** was named national sales manager for closed-circuit television, **Fairbanks, Morse & Co.,** at Yonkers, N. Y.

**R. W. Goeldner** was made vice president-engineering, and **R. I. Preuit** vice president of government sales and service at **Aqua-Chem Inc.,** Waukesha, Wis., manufacturer of sea and brackish water conversion equipment.

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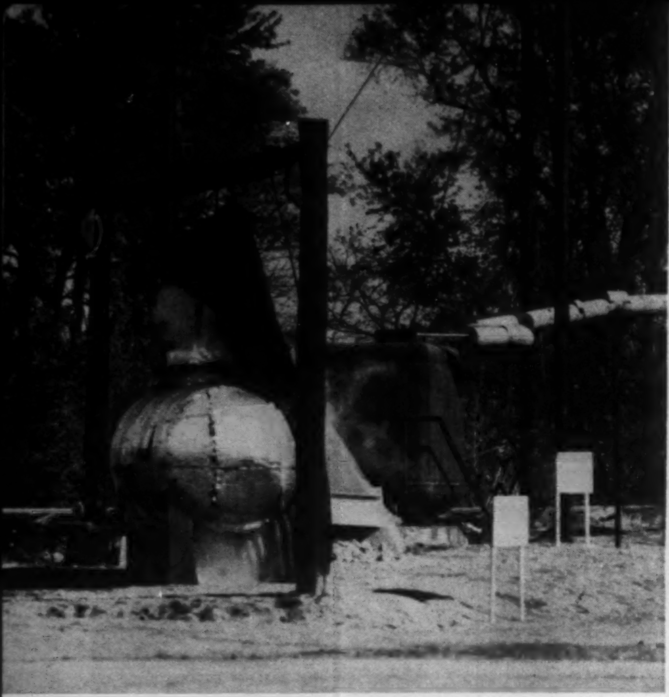
## *OBITUARIES...*

**Roderick J. Whelan,** 70, president, **Ohio Nut & Bolt Co.,** Cleveland, died Oct. 12.

**Edward J. Bolton,** 57, general traffic manager, **Luria Bros. & Co. Inc.,** New York, died Oct. 6.



Burst-test for cylindrical-pressure vessels fabricated from USS 9% Nickel Steel, cooled to −320°F, then pressurized to bursting. This one was quenched and tempered—not stress relieved.

**Same vessel after bursting at a pressure of 2,160 psi—almost 6 times the design pressure of 370 psi.**

# Operation Cryogenics—Success story of USS

Destruction tests on welded tanks holding liquid nitrogen prove that vessels made from quenched and tempered or double normalized and tempered 9% Nickel Steel, *without* post-fabrication stress relieving, equal—and often exceed—the performance of vessels made of the same steel, which are stress relieved after fabrication.

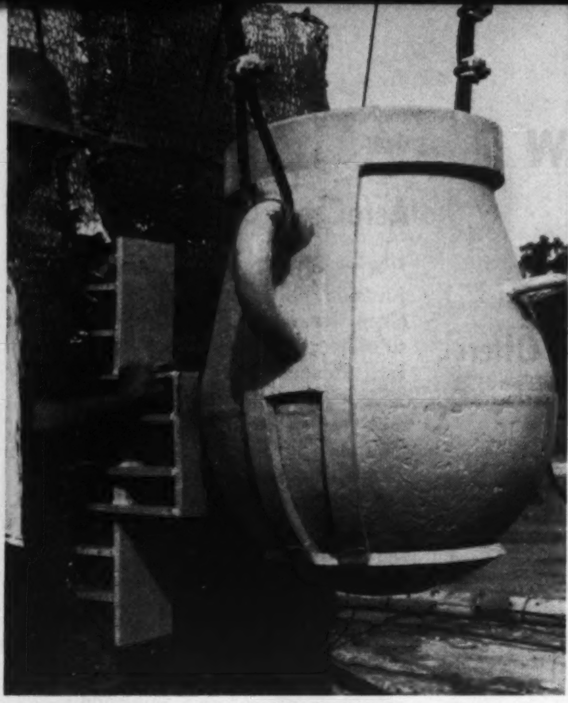
Recently, a series of impact and burst tests, known as "Operation Cryogenics," were performed on 9% Nickel Steel pressure vessels at the Fairless Works of United States Steel. The science of cryogenics, involving the development and practical utilization of materials in extremely low-temperature service, has assumed major importance in industry and in national defense. Much preliminary and advanced development work has been done cooperatively by The International Nickel Company, Inc., The Chicago Bridge & Iron Company, and United States Steel Corporation.

**Objectives of "Operation Cryogenics"** were to demonstrate (1) the suitability of 9% Nickel Steel, quenched and tempered or double normalized and tempered, in the as-welded condition (not stress relieved), for very low-temperature use; (2) the excellent properties of quenched and tempered 9% Nickel Steel; (3) the ductile behavior of 9% Nickel Steel in the as-welded condition during enforced failure at very low temperature; (4) the behavior of 9% Nickel Steel in the stress-relieved condition for very low-temperature use.

**Test conditions:** Two basic types of vessels were tested—rectangular vessels 8 feet square and 6 feet high simulating a type that might be used for shipboard transportation of liquefied gases, and cylindrical vessels 4 feet in diameter and 13 feet long with hemispherical heads such as are used for land-based storage and transportation of liquefied gases. All vessels were welded from economical 9% Nickel Steel plate $\frac{3}{8}$" thick, from the same heat of steel.

A total of nine vessels was built for the test. Five were made from 9% Nickel Steel plates and forgings in the quenched and tempered condition (QT) and four in the double normalized and tempered condition (NNT). Further, six of the vessels were tested as welded (AW), without any heat treatment after fabrication. Three were stress relieved (SR).

**Impact test results.** Impact testing of the three rectangular vessels, refrigerated with liquid nitrogen to -320°F, illustrated that 9% Nickel Steel vessels are capable of undergoing extensive plastic deformation even at extremely low temperatures. The vessels were repeatedly impacted both under pressure and without pressure by blows exceeding 80,000 foot-pounds. One quenched and tempered vessel did not fail, despite 7 impacts. Results clearly indicated the ability of quenched and tempered 9% Nickel Steel vessels in the as-welded condition (not stress relieved) to withstand impacts far beyond any which are likely to occur in service.



4340-pound wrecking ball used in striking rectangular vessels from varying heights.

Impact Test—Rectangular vessel of 9% Nickel Steel quenched and tempered but not stress relieved, refrigerated to −320°F. Withstood severe impact of 82,460 foot-pounds and did not fracture, proving superior strength and toughness of the steel.

# 9% Nickel Steel Tanks punished at −320°F.

**Burst test results.** The cylindrical vessels were designed for 370 psi internal pressure (hoop stress in shell equal to 23,750 psi). These vessels were refrigerated to −320°F with liquid nitrogen and pressurized to failure. *The burst pressure for all vessels was at least four times the design pressure of 370 psi and one of the non stress-relieved vessels didn't burst until 2,300 psi.* (See Table I)

These tests prove that USS 9% Nickel Steel has the high strength, toughness, and weldability needed for low-temperature pressure vessels.

We urge you to consider USS 9% Nickel Steel for economical low-temperature vessels. For the complete story, write to United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

*USS is a registered trademark*

**BURST TESTS 9% NICKEL STEEL CYLINDRICAL VESSELS**

| | PC-1 | PC-2 | PC-3 | PC-4 | C-5 | PC-6 |
|---|---|---|---|---|---|---|
| Heat Treatment | QT | NNT | QT | NNT | QT | NNT |
| Test Condition | AW | SR | SR | AW | AW | SR |
| Temp of Vessel (°F) at start of test | −308 | −320 | −320 | −320 | −320 | −322 |
| Temp. of Vessel at Failure (°F) | −304 | −320 | −311 | −310 | −302 | −314 |
| Burst pressure (psi) | 2,275 | 1,550 | 2,125 | 2,300 | 2,160 | 2,100 |
| Burst stress (psi) | 135,510 | 92,920 | 129,800 | 135,730 | 132,500 | 129,100 |

**TABLE I.** Complete data are shown for burst testing of the cylindrical vessels. In each test, the vessel was filled with liquid nitrogen, supply valves were closed, and pumping continued to build up pressure to bursting point. The data show quenched and tempered (QT) or double normalized and tempered (NNT) vessels in the as-welded (AW) condition withstood greater burst pressures and stresses than did the stress-relieved (SR) vessels.

**IMPACT TESTS 9% NICKEL STEEL RECTANGULAR VESSELS**

| | PR-1 | PR-2 | R-3 |
|---|---|---|---|
| Heat Treatment | QT | NNT | QT |
| Test Condition | AW | AW | AW |
| Impact number | #9 of 11 | #5 of 6 | #7 of 7 |
| Vessel Temp. (°F) | −293 | −317 | −308 |
| Height of Drop, ft. | 19 | 19 | 19 |
| Kinetic energy of 4340 lb. weight (ft-lb) | 82,460 | 82,460 | 82,460 |
| Impact Velocity of 4340 lb. weight (fps) | 35 | 35 | 35 |
| Vessel pressure before Impact (PSI) | 106 | 100 | 0 |
| Total indentation after test (inches) | 2.44 | 1.38 | 3.38 |

**Table II.** Data are shown only for the impacts which resulted in cracking or fracture of vessels PR-1 and PR-2. The two vessels were subjected to repetitive tests under increasingly severe impact and pressure conditions, leading up to the test which finally enforced failure. Additional impact tests were conducted on the failed vessels to determine further distortion and dimensional effects. For vessel R-3, which did not fail, data are shown only for the last impact.

United States Steel Corporation—Pittsburgh
Columbia-Geneva Steel—San Francisco
National Tube—Pittsburgh
Tennessee Coal & Iron—Fairfield, Alabama
United States Steel Supply—Steel Service Centers
United States Steel Export Company
**United States Steel**

For *maximum* strength . . . toughness . . . safety

# Westinghouse Plans New Tele-Computer Center

NEXT YEAR, Westinghouse Electric Corp. will tie its teletype network, serving 265 company facilities in 188 cities in the U. S. and Canada, with a Univac 490 computer.

It will set up a Tele-Computer Center a mile east of Pittsburgh for control of the mass and variety of information it says is necessary to run a modern production and marketing complex efficiently.

Information now mailed from many different points can be sent by wire in a few seconds and automatically correlated by the computer.

Teletype messages will also be routed automatically by the computer. The present semiautomatic system handles about 15,000 messages a day. A 50 per cent boost in volume is expected by 1963.

Unlike conventional computers that can only work on one problem at a time, the Univac 490 (made by Remington Rand Div., Sperry Rand Corp.) can handle a wide range of tasks originating from many points simultaneously. It will be able to distinguish between incoming messages and data and will be able to interrupt its work to take care of new information, then return to the original problem.

The Tele-Computer Center equipment is compatible with any medium or large computer in the company. Thanks to the use of Common Business Oriented Language (COBOL), computer data are interchangeable. COBOL also permits programing instructions to be fed into the computer in English instead of codes or symbols.

## Brush Beryllium Opens Doors at New Plant

Brush Beryllium Co.'s $3 million, beryllium fabricating plant (STEEL, July 31, p. 52) has been dedicated. The 97,000 sq ft structure will employ about 325 people. They will finish beryllium parts.

## Machine Tool Maker Offers Engineering Services

Design Development Engineering Div., Motch & Merryweather Machinery Co., Cleveland, has made its services available to industry on an hourly or contract basis. Fred H. Chorman is manager of the group. Services offered include product design, manufacturing engineering for product production, design and building of prototypes and production machinery, as well as the experimental development of mechanical equipment. Other services include product improvement and redesign, engineering research, and the modernization of production facilities and machinery.

## To Boost Copper Output

A 100 per cent increase in copper production will result from new melting, casting, and handling facilities planned by U. S. Metals Refining Co., Carteret, N. J., a subsidiary of American Metal Climax Inc. The $1.8 million construction project stems from a doubling of consumer demand for copper since 1957, says Frank Coolbaugh, president of Climax.

## Kearney & Trecker Corp. To Consolidate Facilities

Kearney & Trecker Corp., Milwaukee, will vacate and sell its W. National Avenue plant and consolidate machine tool building operations in its S. 108th Street facility. The $3 million changeover is part of an expansion program—280,000 sq ft of manufacturing, material handling, and office space added at the new location. The modern structure will give the firm height and crane capacity needed to make larger and more complex machine tools, says Francis J. Trecker, president.

## AeroChem Lab Expands

A new laboratory in Monmouth Junction, N. Y., will allow AeroChem Research Laboratories Inc., a subsidiary of Pfaudler Permutit Inc., Rochester, N. Y., to expand its work in propellents, combustion, and gaseous electronics. Dr. H. F. Calcote, director of research for AeroChem, says the company also plans to develop a material research program. The 10,000 sq ft lab will be finished in the spring of 1962.

## Engelhard Forms New Unit

Engelhard Industries Inc., Newark, N. J., has set up a Semiconductor Materials Dept. at its D. E. Makepeace Div., Attleboro, Mass. It will specialize in precious and base metals. The facility will provide gold, silver, and platinum group metals as solid alloys, doped alloys, or clad to base metals, in sheets, ribbon, fine wire, or preforms. Clifford Homer is production manager of the department.

## Welded Tube Adds Space

Welded Tube Co. of America, Philadelphia, has added 50,000 sq ft to one of its factory buildings at a cost of $300,000. The enlarged structure provides 100,000 sq ft for the processing and warehousing of raw steel stock and finished welded tubing, in addition to the area occupied for manufacturing. The building will be equipped with two overhead cranes and two cutoff machines. The project is part of a $3.5 million expansion program.

## Wirz Enlarges Facilities

A. H. Wirz Inc. acquired 27,000 sq ft of warehouse space adjacent to its Chester, Pa., plant. The purchase is part of a long range expansion program. The firm makes metal tubes and plastic bottles and containers.

The company is expanding its blow molding facilities at Swedesboro, N. J.

## Griffin Wheel Co. Opens Sixth Plant

To keep pace with the trend toward faster, heavier, longer freight trains, Griffin Wheel Co., Chicago, a subsidiary of American Steel Foundries, has opened its sixth plant (in Bensenville, Ill.). The $6 million installation will bring the firm's total capacity to about 525,000 steel wheels annually.

Electric furnaces are employed in the Bensenville plant, covering 135,000 sq ft on a 36 acre tract.

In making the announcement, ASF President Joseph B. Lanterman noted that orders for Griffin steel wheels in the last 12 months were 22 per cent over those of the like 1960 period.

## Carpenter Builds Strip Mill

Construction of a $4.5 million, cold rolled, strip mill has been started by Carpenter Steel Co. at its West Shore property in Reading, Pa. It will replace cold rolling capacity at the firm's Reading plant. Planned purchases include a Sendzimir mill and related equipment for precision cold rolling and a precision, four high, rolling mill equipped with gaging and size control devices.

## ASSOCIATIONS

Walter E. Brown, executive vice president of Kiowa Corp., Marshalltown, Iowa, is the new president of **American Die Casting Institute.** W. G. Newton Jr., president of Newton-New Haven Co., West Haven, Conn., is vice president.

Marvin S. Bandoli, senior vice president of Pendleton Tool Industries Inc., Los Angeles, has been elected president of the **Service Tools Institute.** R. D. Sulentic, president of the Waterloo Valve Spring Compressor Co., Waterloo, Iowa, is the new vice president. The national trade association represents U. S. manufacturers of pliers, wrenches, hammers, and related mechanics' hand tools.

## CONSOLIDATIONS

**Howe Sound Co.,** New York, has purchased the plant facilities and inventory of **Pennsylvania Electric Steel Casting Co.,** Hamburg, Pa. The steel casting firm will operate as a division of Howe Sound.

**Electrada Corp.,** Culver City, Calif., has acquired **Gear Industries Inc.,** Ft. Worth, Tex., manufacturer of helicopter transmission gears and assemblies.

**Continental Copper Steel Industries Inc.** has acquired the fiberglass screening plant of **Indiana Wire Products Inc.,** Greensburg, Ind. The plant has an annual capacity of 25 million sq ft of fiberglass screening. This marks Continental's entry into this field.

## A. O. Smith to Boost Electrode Output

A $250,000 facility expansion at the Leola, Pa., plant of A. O. Smith Corp.'s Welding Products Div. will double the company's production of manual, arcwelding electrodes. The boost will meet the increased needs of the Eastern and Southeastern electrode markets.

More than 500 electrode types and sizes will be produced by a new bake oven fired by propane. It can handle 12,000 lb of electrode rods an hour at temperatures up to 1000° F—although that level is not presently required.

Another innovation is a custom designed draw bench, which can turn out electrode core wire faster than 1200 ft per minute. It mechanically descales, draws, straightens, and cuts in one continuous operation.

## Hydrofoil Features Aluminum Forgings

HIGH STRENGTH aluminum forgings will support the foils, or wings, of the hydrofoil ship *Denison,* an experimental vessel being built for the Maritime Administration. Hand forgings from the Cleveland Works of Aluminum Corp. of America were rough machined by Production Experts Inc., Cleveland. Final machining was done by Grumman Aircraft Engineering Corp., Bethpage, N. Y. The 100 ft long *Denison,* designed to ride above the ocean at speeds up to 70 mph, is being built by Grumman and its affiliate, Dynamic Developments Inc., Islip, N. Y.

AGRICULTURAL
LIME

# M&T spray-on vinyl finish goes where the wear is

Two major advantages work for any user of M&T spray-on vinyl finishes. They explain the increasing application of these finishes to automotive interiors such as this station wagon deck as well as appliances, business machines, metal cabinets and instruments.

First is a service benefit. M&T spray-on vinyls are so resistant to abrasion, they outwear ordinary textured enamels by as much as 10 to 1. They also resist stains, scuffing, gouges and cuts. Products that take hard wear look better longer with such a finish.

Second big advantage is in production. These finishes provide a distinctive texture via the *spray gun.* On smooth metal, they can be chemically textured to afford a rich, leatherlike appearance. Sprayed on patterned metal, they "mirror" the pattern with high fidelity even when applied in thicknesses up to 15 mils.

Since the coating is applied to the finished part, it simplifies welding or forming, covers any complex shape, and leaves no raw edges to rust. Rejects are easily stripped and scrap metal is uncoated, for higher scrap value.

M&T has newly enlarged plants to deliver the known quality of vinyl coatings in quantity, in colors specified, on schedule. Plastisol coatings are also produced for heavy duty, industrial protective coating applications. Send for details on M&T Spray-On Vinyls, or for an M&T coating specialist to study your requirements and advise you.

M&T

**coatings** · chemicals · minerals · detinning
plating products · welding products

METAL & THERMIT CORPORATION, General Offices: Rahway, New Jersey
In Canada: M & T Products of Canada Ltd., Ontario

# Technical Outlook

October 23, 1961

**'DYNAPAKED' SHEET SHAPES—** The Air Force wants a high velocity forming method for sheet metal shapes. It has a contract (worth nearly a quarter million dollars) with the Advanced Products Dept., Ft. Worth, Tex., General Dynamics Corp., to develop techniques. Method: Dynapak adapted with rubber pads.

**FIX JIG STANDARDS—** Members of the National Institute of Jig & Fixture Manufacturers have agreed on dimensional standards for quarter trim screws and rest buttons. They are expected to tie in with standards already adopted by machine tool manufacturers and contribute to interchangeability and modular construction techniques. You can get details by writing to the institute at 1658 Victoria Ave., Lakewood 7, Ohio.

**MODERN STEEL CONTROL—**Continuous reading and recording of molten steel temperatures in open hearths may soon be here. Participants at a meeting of the Association of Iron & Steel Engineers (AISE) in Pittsburgh learned that preliminary work has already been started by a large steel producer. Also on the way: Continuous analysis of carbon in the molten steel.

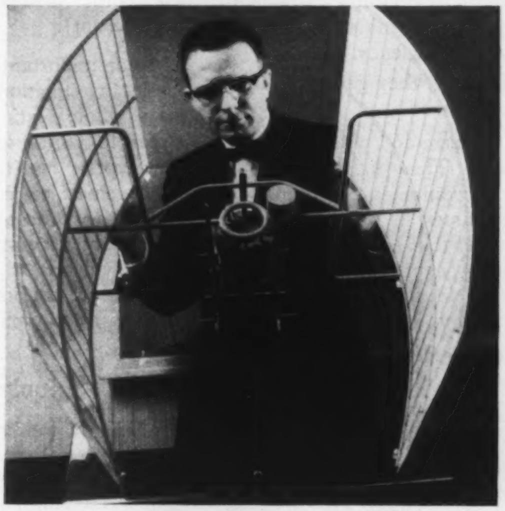
**DEVELOPS SUPERROCKET CASE—** A high strength steel rocket motor case handles stresses of 311,000 psi, claims Pratt & Whitney Aircraft Div., East Hartford, Conn., United Aircraft Corp. It's made of vacuum improved H-11 die steel.

**ANNOUNCE STEEL RESEARCH—** New steels for high strength, low temperature applications are the object of a program being sponsored by the Bureau of Mines, Washington. Its metallurgists will also seek more information on high temperature reactions, the refining of molten pig directly to steel, and uranium as an alloying element.

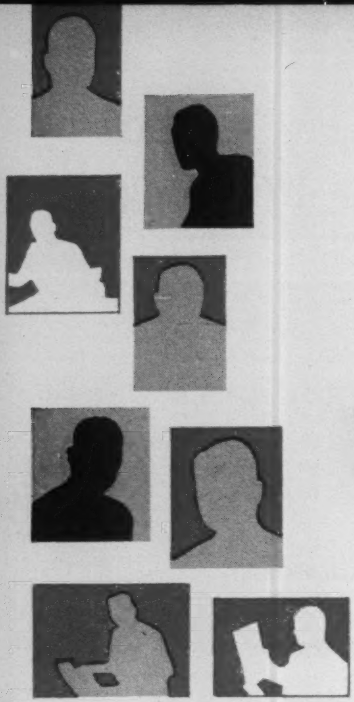
**PLATINUM SANDWICH—**To improve the life of platinum glass equipment for glassmaking, a three layered sandwich of powdered platinum between sheets of wrought platinum has been developed by Engelhard Industries Inc., Newark, N. J. The sheet next to the glass may be pure platinum; the inner layer and the outside sheet may be a platinum alloy to improve heat resistance. It's being used for crucibles, thermocouple sheaths, and small melting pots.

**IMPROVED HI-TEMP LUBRICANT—** Commercial quantities of tungsten disulfide are available from the Chemical & Metallurgical Div., Towanda, Pa., Sylvania Electric Products Inc. The material can be employed as a solid film or as an additive in wire drawing, metal forming, cutting, working, and in valves, gears, and bearings, the firm states.

**RUSSIANS HAVE PROBLEM—** Automation of production lines in Russia is seriously hampered by poor abrasive tools, says a Soviet publication, *Mechanization & Automation of Production.* Recent inspection showed that less than 40 per cent of factory production met standards.



**SIXTY MOONPOWER—** A nuclear, thermoelectric power system for space and moon probes develops 50 to 60 watts for three months. Curved shields (above) are waste heat radiators. Heat is transferred by a liquid metal, states the developer, Westinghouse Electric Corp., Pittsburgh.



# Eight Experts Pinpoint Welding 'Mistakes'

**• IF THE BOSS asked you to estimate the optimum efficiency of your welding department, how accurate could you be?**

To help metalworking managers anticipate such an event, STEEL asked eight welding experts to pinpoint the most common mistakes in welding departments that have an influence on efficiency.

In summary, they generally agree on these:

- Don't "make-do" with outmoded equipment. There has been a revolution in equipment, automation, and techniques in the last decade. Don't forget that capitalization costs for welding equipment are low in comparison with those in other areas of your plant.
- Constantly check shop procedures. Overwelding, for example, can double or triple welding costs.
- Seek competent advice on proper weldment and fixture designing, and for solutions to unusual problems related to welding equipment. (Otherwise competent engineers frequently don't know the finer but important points of welding.)
- Review specifications with an expert to get maximum benefits from weldments you buy. The consensus is that lack of welding education is most often the root of such troubles.
- Employ larger weld deposits—they're more efficient than many small passes.
- Seek to buy materials most suited to your welding needs (often, they're not).

Some important areas still require basic investigation by the industry as a whole (fatigue, optimum root areas in joints, for example). But the experts feel that original effort on a small scale can provide answers to those questions—comparatively modest investments will pay dividends.

Here are the important areas the experts think you should watch.

### Equipment

"Many a welding shop supervisor accepts management decisions which saddle him with inadequate facilities and poor equipment," states John Mikulak, Worthington Corp., Harrison, N. J.

Such cases are a paradox: Few things have a greater influence on ultimate machining, cleaning, or assembly costs. Another factor: Capitalization costs are extremely modest compared with those in other industrial areas. (A foundry investment, for example, is eight times higher per employee.)

"Industry can and should expect a satisfactory cash return to justify capital expense for welding equipment," states Mr. Mikulak. "All that's usually needed is a proper analysis technique." (See Page 72.)

**• Evaluate and purchase new equipment, processes, electrodes, say welder manufacturers. The experts concur, but they have several suggestions for buyers.**

Semiautomatic and automatic processes are getting faster each year. But don't conclude they're only for the mass production specialist. Such techniques can be equally suitable in a job shop. "It is fair to say that any shop with two or more welding machines can save money with semiautomatic equipment," one expert advises.

"Our welding engineering division changed from manual to semiautomatic machines on many heavy sections," says J. Munro, Caterpillar Tractor Co., Peoria, Ill. "It was necessary, of course, to alter joint design. But the changes enabled us to increase production while improving quality with low hydrogen weld deposits."

Source: U. S. Navy.

**Foreignmade welds like this one would not pass U. S. appearance standards**

Howard B. Carey, Hobart Bros. Co., Troy, Ohio, relates another example.

"A piping fabricator recently purchased a semiautomatic welder to replace stick electrode equipment. His savings allowed him to bid immediately in more competitive areas. The additional work consequently enabled him to pay off the equipment cost in a little more than four months."

Improper current settings are a common fault, says John L. Lang, Lukens Steel Co., Coatesville, Pa. The problem can often be traced to mistaken economy in purchasing equipment. The solution is to equip every welding unit with both an ammeter and a voltmeter. Without an ammeter, an operator in switching from, say, an E6010 to one of the E7000 types will lower the voltage setting and guess at the current. Results: Lots of spatter, slag inclusions, and poor efficiency.

A final caution: The newer, exotic welding processes may look appealing, but be sure to check enough data before deciding that one is better than the other, or superior to the one you are using.

"Equipment manufacturers as a whole do an excellent job, but the 'performance quotient' of automatic or semiautomatic welders is still an important factor in selection," warns Stuart St. Denis, Lennox Industries Inc., Columbus, Ohio. "Closely check construction and function; then you can predict how well the machine will perform under the conditions in your shop," he advises (see next page).

## Designs and Engineers

"Product designers are influenced greatly by the traditional environments in which they work, states Worthington's Mr. Mikulak.

A clean break is needed if you are to gain maximum benefits from welded construction, he believes. For years, Worthington employed castings almost exclusively. Today, judicious redesigning "marries" castings and weldments with astonishingly good results. Mr. Mikulak says that a centrifugal compressor housing redesigned to include welding cut costs 26 per cent.

Seemingly minor design changes greatly affect ease of welding—sometimes even the ability to complete a job. There is no substitute for discussing a design with the men who will manually weld the job, says R. E. Monroe, Battelle Memorial Institute, Columbus, Ohio. He suggests that poor joint location involves accessibility and often lowers fatigue properties.

Overwelding costs money, and in addition, can mean a poorer job. A well made butt joint is entirely adequate for most jobs. "Attempts to strengthen it with doublers or cover plates lower fatigue strength," he emphasizes.

Lighter structures equally as strong as older designs are possible with welding. Direct substitution of welding in riveted or mechanical designs isn't good practice. Some codes still hamper material economy, claims Mr. Monroe.

- **Conventional foundry, steelmaking, heat treating, or metallurgical engineers are often still tied to rates of energy release found in their familiar environments. Such people are perplexed when they are unable to find answers to welding problems through normal metallurgical or metallographic techniques. Mr. Mikulak says lack of adequate welding education is often at fault.**

For example, metallurgists and engineers at a Worthington subsidiary were unable to understand cleavage failures in pressure vessel welds which appeared during tests. Analysis of the normal cooling (S) curve employed in heat

**John Mikulak points to engineers and producers of materials as keys to immediate welding progress...**

Assistant to the vice president,
Worthington Corp.,
Harrison, N. J.

**"Many managements pass over opportunities to save with improved welding processes," says Stuart St. Denis...**

Welding engineer,
Lennox Industries Inc.,
Columbus, Ohio

## How to Buy Welding Equipment

FAR TOO MANY $1000 to $5000 welding machines stand unused in storage yards, believes Stuart St. Denis, Lennox Industries Inc.

Usual reason: Purchasers don't exercise as much care as they do when they buy larger capital equipment.

You can probably avoid similar mistakes if you consider these factors before you buy, advises Mr. St. Denis:

- What production rate is required.
- How many parts do you expect to produce?
- If you expect to amortize the investment, how much will that add to part cost?
- What kinds of fixtures are needed?
- How many parts per hour can the equipment turn out?
- What is the predicted rejection rate?
- How much improvement will your fabrication practices need before you obtain satisfactory welds?

Application is a big factor. Investigate thoroughly before making a decision.

treating indicated proper metallurgical properties.

"Simply pointing out the extreme quenching effect of rapid cooling experienced in welding (austenite, in this case, transformed directly into martensite), resulted in a satisfactory solution. By changing electrode size and increasing the amount of energy put into the weldments, we increased residual heat and slowed cooling sufficiently to avoid the problem," relates Worthington's Mr. Mikulak.

"Personnel properly trained in metallurgical behavior and the characteristics of welding are still the best insurance against the failure of materials or processes," emphasizes Battelle's Mr. Monroe. "Such people, for example, understand that proper heat treatment can prevent accelerated weldment corrosion or drastic reductions of physical or mechanical properties."

He suggests that the welding engineer should be responsible in his area. It's an effective means of combating mistakes.

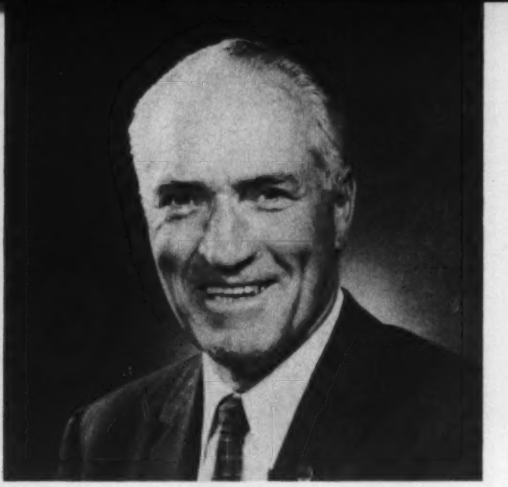
**• Some tool and equipment designers don't know about the high forces and shrinkages involved in jigging weldments. They seem to be unaware that large metal masses are magnetized by welding currents. Such "permanent" magnetic fields seriously affect arc stability and direction.**

An automatic seamwelder and fixture at one Worthington plant turned out poor quality work—welds weren't acceptable to an insurance inspector.

"I looked at the welding fixture," says Mr. Mikulak. "It had far too much metal near the weld area. By laying the power cable in a direction to oppose the permanent magnetization in the fixture (determined with a compass), we easily demonstrated that good welds could be made."

Mr. Mikulak says that often happens with welding positioners when the table becomes magnetized. It is most easily noticed when semiautomatic and automatic welders are employed.

**• If any single problem can be**



**The users' viewpoints are often overlooked by welding committees, J. Munro points out . . .**

Vice president,
Caterpillar Tractor Co.,
Peoria, Ill.

**Minor design changes greatly affect ease of welding, states R. E. Monroe**

Assistant chief,
Metals Joining Division,
Battelle Memorial Institute,
Columbus, Ohio

**called "industry-wide," it is poor fixturing, says A. Lesnewich, Air Reduction Co., New York.**

It's most often found among:

- Low bidders on government contracts.
- Subcontractors on low cost, high volume production items.

The reasons: Lack of knowledge and mistaken economics. The files of the Special Products Dept. at Airco are filled with such instances, says Mr. Lesnewich. The firm is often called on to design and build special fixtures to bail out unfortunate subcontractors.

The best solution, says Mr. Lesnewich: Be sure your welders and engineers fully understand that a welding arc has no magical ability to compensate for machining errors or an inaccurate fitup.

- **Lack of proper restraint in welding heavy sections (2 in. and larger) gets the vote of Lukens Steel's Mr. Lang for one of welding's most common errors.**

Most usual result: Cracking on the side opposite the neutral axis of the weld.

Welders have had satisfactory experience in joining heavy plates formed into a cylinder or some self-restraining shape, so they neglect to provide the right kind of temporary bracing across joints, states Mr. Lang.

Lukens Steel developed a technique for installing large plates with braces. The technique grew out of early observations during the joining of plates 4 in. thick and about 250 in. long. (Welds are placed alternately on each side of "U" joints.) Mr. Lang noticed that the root cracked every time the plate was turned over after the first pass.

The staff at first tried precambering to offset the large bowing produced in first passes, but it was unsuccessful. With extra large braces rigidly welded, the plates are sound. The compressive strain marks in the brace (they crack the mill scale) show just above the joint.

- **Another common stumbling block: Failure to recognize that a poor fit means increased welding costs regardless of whether joining is done manually or semiautomatically.**

"In the field, engineers frequently hear shop foremen complain they can't get good enough fitups to justify semiautomatic or automatic welding techniques," explains Worthington's Mr. Mikulak. "That's no excuse when you realize that manual welding costs are also increased by poor fitups."

Here he cites an example: In 1/4 in. metal, when joint gaps (fitup) are no better than 1/8 in. (1/32 in. is normal), manual welding costs increase 320 per cent.

"Cut metals as efficiently and accurately as possible," advises Hobart's Mr. Carey. "More accurate metal fabrication allowed a producer of farm equipment to reduce its setup time more than 25 per cent. Because parts fitted jigs without reworking, welding time was appreciably reduced."

Suggestion: Modern flame cutting equipment produces highly accurate parts.

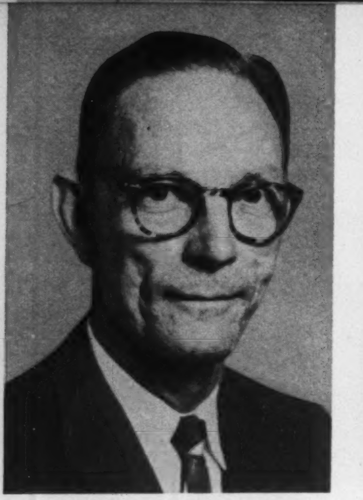
A careful overhaul of shop equipment and methods is also profitable, believes Mr. Mikulak. A frequent cause of poor fitups: Dull shear blades, worn gibs, poor alignment of old shears.

- **Overwelding is directly related to fitup problems.**

"Overwelding is a common shop problem that can no longer be blamed entirely on engineers and designers," claims Lennox's Mr. St. Denis. Reason: Tremendous improvement in weld symbol application during the last five years.

He also believes that management has neglected to warn production, quality control, and time study people about the dangers of overwelding. For example, do they know that a 5/16 in. fillet weld has 50 per cent more weld metal than a 1/4 in. fillet?

- **Carelessly and incompletely written specifications play into the hands of low bidding, inexperienced fabricators, claims Helmut Thielsch,**



Good bracing eliminates root cracks in large plate welds, says John Lang . . .

Welding engineer,
Lukens Steel Co.,
Coatesville, Pa.

Insufficient knowledge, poorly prepared specifications are leading causes of welding mistakes, emphasizes Helmut Thielsch . . .

Metallurgical engineer,
Grinnell Co. Inc.,
Providence, R. I.

Grinnell Co. Inc., Providence, R. I.

"It is essential that engineers spell out each of these details: Quality level of materials; the method, process, technique and quality level of welding; the inspection level; and degree of perfection required."

He cites this example to support his statement: "The workmanship of some welds in a highly critical system turned out to be defective. The purchaser's engineers wanted the contractor to repair them, but after Grinnell Co. inspected the specifications, we had to rule that the responsibility was the buyer's since the piping system specifications had been improperly drawn.

"Unfortunately, many engineers who write specifications apparently don't understand such things as applicable codes, welding process and procedures, the properties of weld deposits, and the capabilities and limitations of inspection equipment and techniques," concludes Mr. Thielsch.

- **Establish optimum welding procedures, suggest experts.**

"Unless procedures are determined and posted in a shop, managers will notice a large variation in welding performance," notes Mr. Carey. Both he and Mr. St. Denis suggest that the laboratories of welding equipment manufacturers are sources of top rate information about procedures.

"Several firms have special products groups which will engineer, design, and even guarantee the rejection rate of your application," states Mr. St. Denis.

Welding isn't efficient unless you control procedures—that means current, voltage, electrode size, and especially weld size.

"I still find shops that rate welders on how industrious they look. Intolerable! You must compare arc time (converted to inches per minute) and some standard weld speed established in a procedure," he emphasizes.

- **Many people believe that small, multiple pass beads produce less distortion and greater impact properties than a few large deposits. That isn't so, declares Mr. Mikulak.**

That concept is contrary to results obtained with high energy, automatic welding, which by comparison with the many-pass technique, reduces distortion 70 to 90 per cent. Also, impact values are generally controlled by the ratio of energy input to the cooling rate. Employing small beads only tends to increase welding costs.

## Some Unfulfilled Needs

Despite the obvious lag between what is possible and what management has put to work, not all welding problems are the fault of management. Here are several areas to watch:

"Many welding problems are traced to a lack of basic knowledge," believes Mr. Lesnewich. Without it, responsible supervisors and engineers are unable to take full advantage of modern welding processes. Unfortunately, not enough of them take even basic welding courses.

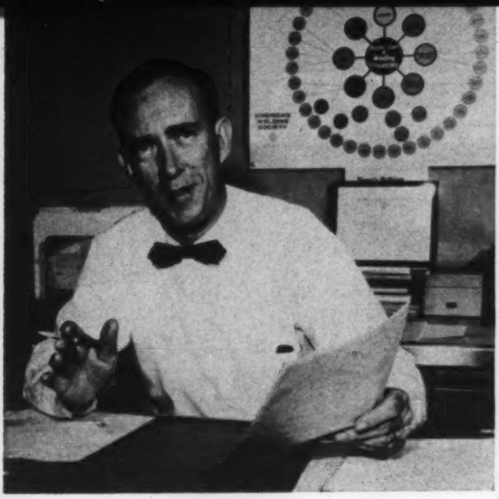
For example, Mr. Lesnewich relates the case of an otherwise competent engineer who had to join a quenched and tempered steel (like "T-1") which called for a lower than normal energy input. He decided to cut the arc voltage. Result: A porous weld which he blamed on the specification.

The correct answer was: Also lower the current. Lower voltage simply shortened the arc, causing a periodic short circuit which formed the porosity. If the engineer had the benefit of a basic welding course, says Mr. Lesnewich, he would have known enough to make the proper electrical setting.

Mr. St. Denis agrees. He finds that supervisors frequently depend on one of their subordinates for welding information. "Often, that's worse than nothing. Foremen should be given training to enable them to take better advantage of welding possibilities. They ought to be encouraged to become experts."

- **Steel suppliers are not yet sufficiently aware of the need for better shapes and a type of quality better suited to welding needs.**

"I once investigated the struc-



**Inadequate education of supervisors is a leading cause of welding errors, believes Howard B. Carey . . .**

Director,
Hobart Bros. Technical School,
Troy, Ohio

**Poor fixturing is an oft-repeated mistake, claims A. Lesnewich . . .**

Supervisor,
Welding & Joining Metallurgical Development,
Murray Hill, N. J.,
Air Reduction Co.

tural 'T' shape stress patterns," says Mr. Mikulak. As employed in welding, the area where both parts of the "T" join is a stress raiser. The back face opposite the leg should have an indentation (it could easily be rolled into the shape). Such a move would save from 3 to 5 per cent in materials and improve the stress distribution.

The same idea applies to a simple angle iron where stress concentration is 26 per cent higher than the ideal. From a welding standpoint, a flat piece bent into an angle is more efficient because it eliminates the sharp outside corner (a stress raiser).

• **Mr. Mikulak cites an experience with quality. Sometimes it is necessary to work with the steel supplier directly to obtain the quality you require.**

Worthington was experiencing some problems with laminations in plates 3 to 3½ in. thick. The product: Frames for diesel engines.

"How can we order steel plates to eliminate that problem?" Worthington demanded to know. Answer: Request flange quality rolled from the first crop (cleanest) of the billet.

"Unfortunately," relates Mr. Mikulak, "the first batch didn't pass an ultrasonic test at our plant. We found out later that the supplier wasn't equipped to give our material such tests, so several plates from second or third crops slipped by. We've had no further trouble after insisting on what we needed."

• **"More factual data are needed on steels with up to 100,000 psi yield strengths, particularly with regard to fatigue and optimum joint design," states Mr. Munro.**

To achieve more efficient designs for high performance equipment, more information should be sought about welded joint fatigue in high load-low cycle, and low load-high cycle applications, says Mr. Munro.

"We have worked with Battelle Memorial Institute to obtain fatigue values on many joints in our equipment. In one case, we were able to reduce weld size 50 per cent and upgrade joint quality at the same time," he continues.

"We particularly need information about usable root openings and proper angles for edge preparation. They must be correctly related to each type of fusion welding process operating in normal factory conditions."

To obtain such data, Mr. Munro urges participation in professional societies. "Caterpillar is always working with committees of technical societies to place the users' viewpoint on record."

• **The underlying reason for many welding problems can be traced to excessive price fighting, states Mr. Thielsch.**

"The continually sharp competitive pattern has placed undue emphasis on price, frequently bringing sloppy workmanship, improperly authored welding specifications, insufficiently trained and improperly qualified welders, and either no or inadequate inspection," he emphasizes.

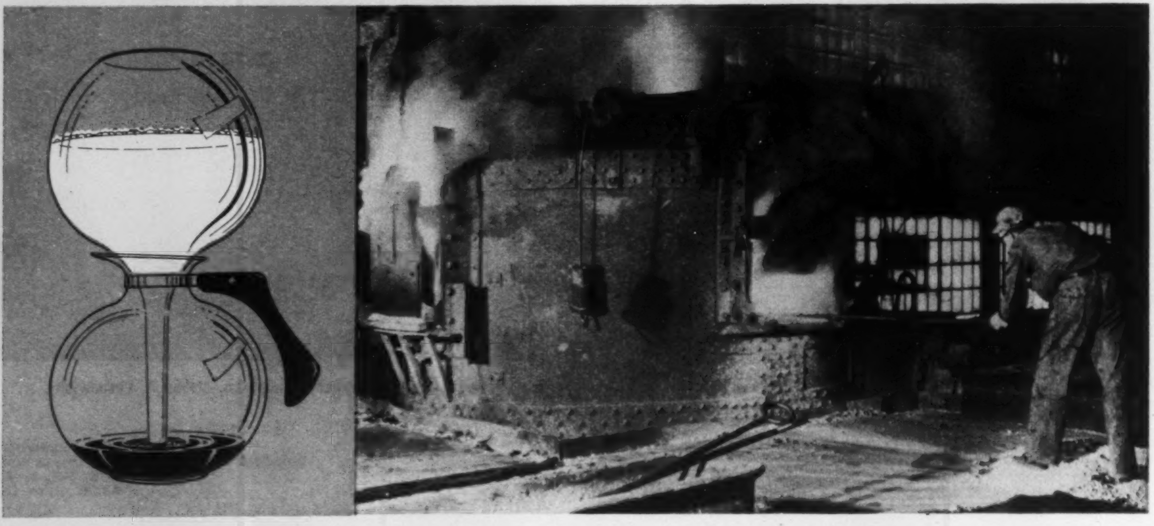
Too many fabricators bid for work on which they have neither experience nor qualifications. That has been glaringly true on government contracts where bids are accepted from completely unqualified welding fabricators. Some government inspectors tend to miss defective "weldmanship," Mr. Thielsch believes.

• **A final caution: Make certain welders are properly qualified.**

"We once examined several pipe test sections welded to code requirements. The applicants had made the first pass from inside the pipe (that's cheating—and utterly impossible in the field), then completed the weld from the other side. The coupons were doctored to remove all traces (spatter) of the 'unique' method of welding," relates Mr. Thielsch.

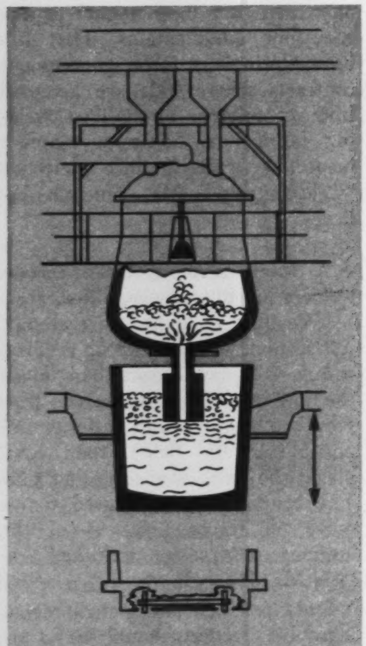
Only polished and etched metallographic sections could have revealed the deception.

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service,* STEEL, *Penton Bldg., Cleveland 13, Ohio.*



***Device that's much like a coffeemaker purifies electric furnace heats . . .***

# Vacuum Process Upgrades Forging Steels



**Reduced pressure causes steel to rise through the nozzle and form a shallow pool in the bottom of the vessel**

**• NONMETALLICS in forging steels are said to be reduced at least 30 per cent by treatment in a Dortmund Horder (D-H) cyclic vacuum processing unit at National Forge Co., Irvine, Pa.**

The unit, which handles 10 to 60 ton heats from the company's air melt electrics, should provide the level of steel cleanliness that's called for in many of today's forgings (see STEEL, Sept. 11, pp. 102-108). Installed by Lectromelt Furnace Div., McGraw-Edison Co., Pittsburgh, it features a process developed in Germany for the purification of molten steel and the addition of alloying materials under vacuum.

**• The quality of forging steels is improved by effective degassing, thorough mixing, and accurate control of final analysis.**

Removal of hydrogen during the treatment is said to minimize the tendency toward delayed fractures in forgings, caused by hydrogen "flaking." It also cuts down on hydrogen embrittlement.

Removal of oxygen in the vacuum treatment unit, instead of the melting furnace (through addition of silicon or aluminum) is said to reduce the number of nonmetallic inclusions. The inclusions in the treated steel are said to be small and well separated. Continuous analysis of the off-gas from steel under treatment makes the operator aware of oxygen content at all times. Result: Precise quantities of alloys can be added under vacuum.

Constant movement of the steel during treatment helps insure homogeneity of alloy content. Alloy segregation—which sometimes occurs because alloy elements aren't blended sufficiently—is said to be eliminated.

The cyclic treatment is said to reduce heat treating time on many grades of steel, to improve mechanical properties, and increase yield.

The D-H process is said to be more flexible than some other degassing setups. The steel can be poured from the transfer ladle into any number of ingot molds, as in conventional teeming.

"Combination of the best electric furnace melting techniques with D-H vacuum processing makes it

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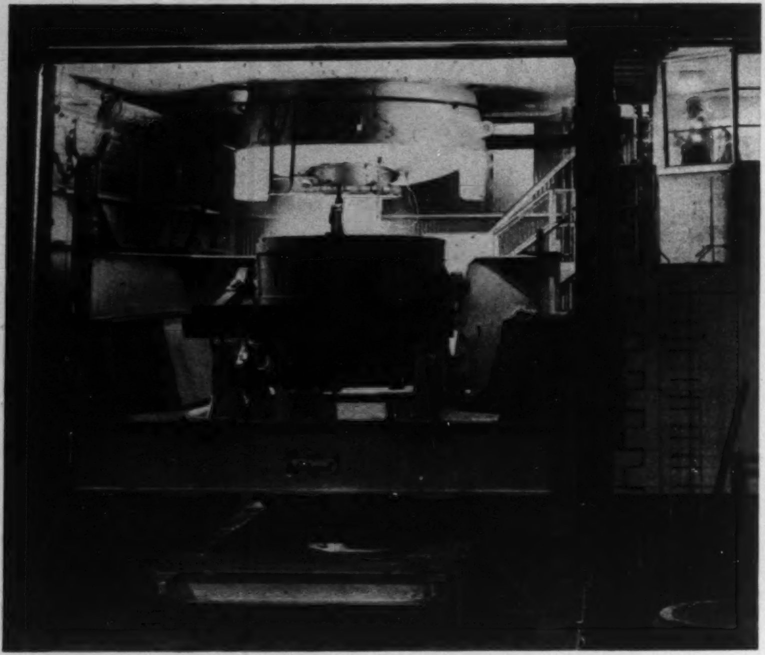


**Hydraulic jacks lift the ladle of steel until the nozzle of the D-H unit is immersed. Then the vessel is evacuated and the treatment cycle begins**

possible to produce steels of a quality previously available only by vacuum melting," says Dr. Robert Clark, the company's director of research metallurgy.

Normal electric furnace melting and oxidizing procedures are followed to insure the removal of excess carbon and phosphorus. The oxidizing slag, which contains undesirable phosphorus, is removed from the furnace. A new, refining slag is then added to bring sulfur content to the desired level.

Samples from the heat are analyzed to determine the exact amounts of alloy elements to be added under vacuum. The heat is then tapped into a ladle and taken to the D-H unit for processing.

- **Repeated processing of small portions purifies the heat prior to alloy additions.**

The ladle of steel is raised hydraulically until the nozzle of the D-H unit is immersed to a depth of about 20 in. (An expendable steel nozzle cover prevents slag from entering the chamber as the nozzle is lowered into the bath.)

A four stage, steam ejector system reduces pressure in the treatment chamber from atmospheric pressure (760 mm of mercury) to 1 mm of mercury in about 30 seconds. Reduced pressure in the chamber causes a head of steel to rise through the nozzle and form a shallow pool in the vessel. The ladle is raised and lowered, so that 3 to 6 tons of steel flow in and out of the vessel on each stroke. The cycle is repeated until the volume of processed metal is three times that of the heat of steel. The addition of alloys from hoppers at the top of the vessel and thorough mixing complete the treatment.

- **Refractory performance has been improved by exclusion of slag from the treatment vessel.**

Chemical reaction of slag with refractories causes deterioration of the vessel lining. The company has boosted lining life and improved steel cleanliness by holding slag from the vessel as much as possible.

A vacuum vessel recently removed from the system for inspection is still in usable condition. Much of its lining may be left in place for further use. Roof lining has been used for 63 heats; sidewalls have handled 126 heats. Bottom linings have been used for 68 heats, nozzle linings 80 heats.

## Self-Dumping Hoppers Cut Scrap Handling Time

USE of self-dumping hoppers has cut scrap handling time in half at Sawhill Tubular Products Inc., Sharon, Pa. Metal chips and short sections of pipe and tubing—generated in the manufacture of tubular steel products—are handled in hoppers of 1 and 2 cu yd capacities. The hoppers were supplied by Roura Iron Works Inc., Detroit.

Hoppers are mounted on skids that are designed to fit lift truck forks, and spotted at collection points throughout the shop. When full, they are picked up and dumped quickly by lift truck operators. Actuation of a release handle on the rear of the hopper causes the unit to rock forward, discharge its contents, right itself, and lock automatically. Scrap is discharged into a large container for delivery to a processing yard. Empty hoppers can be nested to save space.

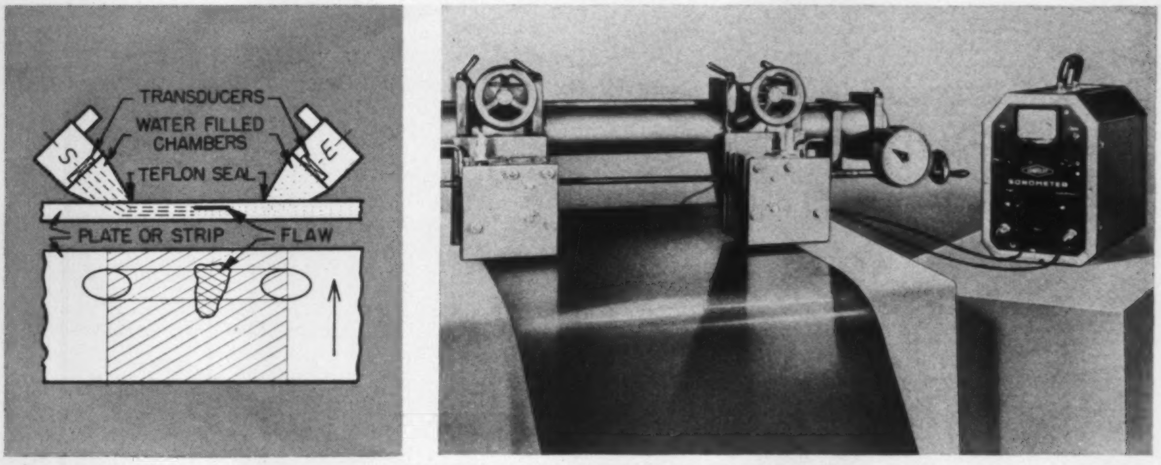
Previously, scrap handling required about 10 manhours a day. Drums and boxes were filled at forming and cutoff machines, moved to a scrap disposal point, and dumped by an overhead crane. About 100 of the containers had to be emptied each day. Boxes and drums became battered and difficult to nest.

## Suggests Blasting Bases Into Moon's Surface

EXPERIMENTS indicate the feasibility of establishing lunar outposts by launching high explosive projectiles that blast large chambers in the moon's surface, reports Germano Di Leonardo, Missile & Space Vehicle Dept., General Electric Co. (Philadelphia).

When men are later landed, the base would be completed by inflating airtight bags in the chambers and digging connecting tunnels. Experiments with explosive charges in a variety of simulated lunar materials have been successful.

Subsurface location offers protection against radiation and meteorite bombardment. Later, binders brought from earth could be used with lunar materials to form surface structures.



**Using plate waves, a pair of probes suffices to test cold or warm strip about 20 in. wide. High flaw sensitivity is reported**

# 'Plate Waves' Simplify Continuous Ultrasonic Tests

**• AN ULTRASONIC technique employing "plate waves" has been designed for production testing of plates, strip, rods, wire, and tubes. Ultrasonic waves propagate along the surface, instead of penetrating the material perpendicularly.**

Little equipment is needed. Basically, the job requires a single pair of probes arranged obliquely to the surface of the material. One transmits; the other (set at the same angle) receives the energy.

High flaw sensitivity results, reports Reimar Pohlman, research laboratory director, Dr. Lehfeldt & Co. GmbH, Heppenheim, West Germany. The ultrasonic beam is capable of covering relatively great distances, he says.

**• The method is economical because of its simplicity.**

In comparison, setups using vertical probes require a large number arranged side by side on both surfaces of the material. The entire testing apparatus may have as many as 30 such transducer pairs when testing plate at a maximum speed of about 98 fpm, says Mr. Pohlman.

**• Plate waves are produced by an ultrasonic wave coming from a medium of lower sound velocity and meeting the plate or strip at an oblique angle.**

The transducers operate in water tanks that are usually above the strip or plate. To protect product finish, the circular opening in the bottom of the tank (where the strip is coupled to the water) is ringed with Teflon. Distance between heads is determined by strip or plate width. Angle of incidence of both transducers varies in relationship to the frequency and material thickness.

**• When testing tubes, the beam is made as small as possible.**

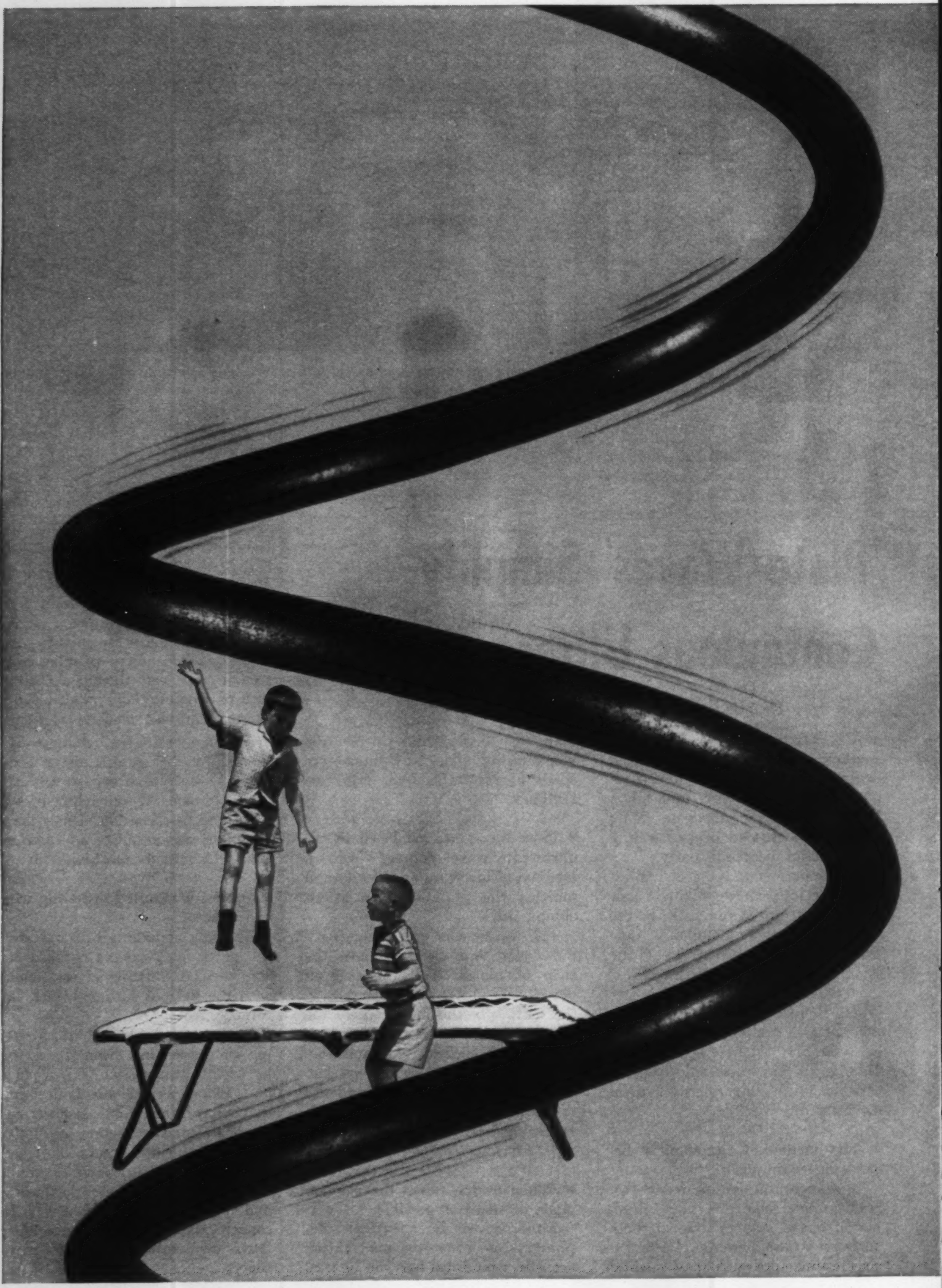
Either a small apertured diaphragm or cone—or an optical, acoustic, cylindrical lens can be used for focusing. Lenses present the possibility of delivering converging rays that can be adjusted so that (even with a relatively broad beam), the angles of incidence of individual rays differ little from each other. The lens method is sensitive to such things as constancy of tube cross section and wall thickness. Structure of longitudinally welded tubes can absorb and confuse readings.

Although radiation is narrowly limited by the diaphragm or cone method, divergence can occur, says Mr. Pohlman. If that happens, the simultaneous excitation of neighboring plate waves causes an interference which limits sensitivity.

**• Success is reported in testing wire and rods.**

By using apparatus with cylindrical lenses, rods can be checked for core defects, interior cracks, and with the help of surface waves, for surface cracks.

For wire under 0.3937 in., a testing procedure has been developed in which transmission takes place in a plane of incidence containing the axis of the wire. Reports indicate that flaw detection sensitivity is high; hairline cracks as small as several hundredths of a millimeter deep, as well as slag seams and pores, can be detected. In copper sheathed wire, boundary flaws are detected with high sensitivity.



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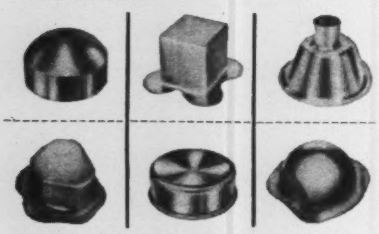

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## New Alloys Developed For Space Applications

DEVELOPMENT of a new family of Space Age alloys is announced by scientists at the research laboratories of Westinghouse Electric Corp., Pittsburgh. The materials are alloys of columbium, a lightweight refractory metal that's noted for its strength and corrosion resistance at extremely high temperatures.

Much of the research and development of the alloys was done under contract with the U. S. Air Force Directorate of Materials & Processes, Aeronautical Systems Division.

- **Key Material**—"Columbium is a key Space Age material," says Dr. S. W. Herwald, Westinghouse vice president-research. "Alloys of no other metal show greater promise as structural materials for manned space vehicles."

The new materials are said to show the best combination of properties achieved to date in columbium alloys. High strength at high temperatures is obtained without appreciable loss of workability or low temperature ductility. And the alloys are light—density is about equal to that of stainless steel.

- **Easy to Work**—"The alloys are remarkably easy to handle, from a metallurgical point of view," says R. T. Begley, metallurgist in charge of the development program. "They can be forged, rolled, sheared, and handled directly, often at room temperature. Processing at high temperatures, in an inert atmosphere, or under protective cladding of a less active metal is necessary only during melting and hot forming."

- **Pilot Production Planned**—Three of the alloys will be produced on a pilot plant basis at the Westinghouse Materials Mfg. Dept., Blairsville, Pa. First in production: B-33, a moderate strength, columbium-vanadium alloy. It will probably be used first in heat exchangers for spacecraft.

Two other alloys scheduled for pilot production are B-66 (which contains columbium, vanadium, molybdenum, and zirconium) and B-77, an alloy of columbium, tungsten, vanadium, and zirconium.

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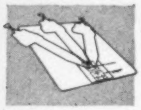

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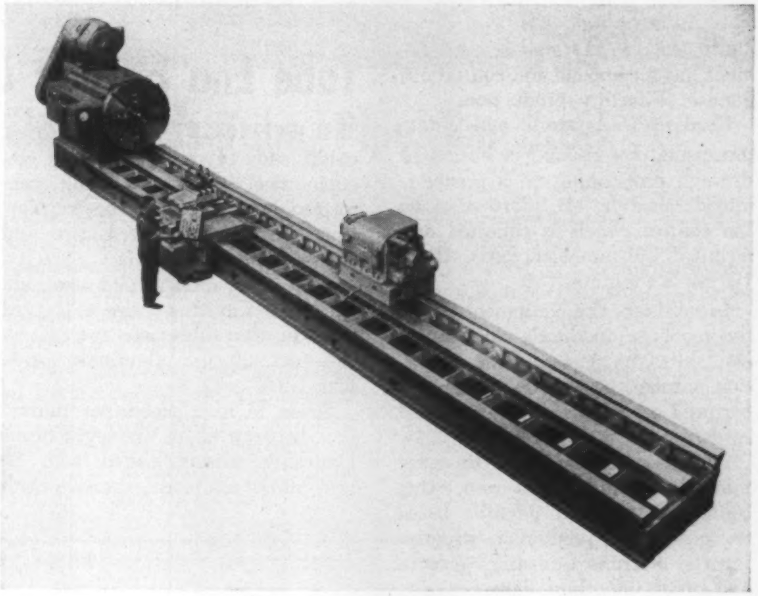
# Innovations Boost Lathe Output, Accuracy



A NUMBER of innovations in the Farrel-Betts general purpose and roll turning lathes are designed to increase productivity, improve accuracy, and reduce handling time.

The units are three-way bed types with swings over the bedway varying 32 to 92 in., depending on the model. More rigid work support is featured. The ability of the carriage to pass the tailstock as well as the steady rests results in less setup time.

The carriage is arranged for numerical or tracer control. A cleaner machine plus less maintenance and operator distraction are benefits of the carriage feed system. Lead screws, rods, and shifter mechanisms are not required.

For further information, *write* Consolidated Machine Tool Div., Farrel-Birmingham Co. Inc., 565 Blossom Rd., Rochester 10, N. Y.

# System Assembles, Organizes Production Data

TELECONTROL

DATA PROCESSING has been added to a central production control system to provide management with another effective tool for coordinating men, machines, and materials. Substantial savings are expected from the development.

Hancock Telecontrol Corp., New York, which four years ago originated its Telecontrol system for gathering and organizing production control data, has introduced a system called Readout-Telecontrol.

Through a sensing device on each production tool, standard Telecontrol reports to a control room whether the tool is producing, totals productive time and downtime, counts units produced, and the balance of the work order not completed. All information is displayed on panels in the controlroom.

Tied in with this equipment is a communications system which enables an operator to summon assistance instantly if his machine requires adjustment or breaks down, if he needs more materials or a new die, or if he runs into other problems.

With all production tools in a plant tied into the system, management has a complete and continuous picture of factory production.

Readout-Telecontrol adds data processing. By pressing a button or through programing on a predetermined schedule, all information on the control panels is collected and recorded on punched cards. Rate: 100 cards a minute.

In addition, the equipment enters the machine operator's clock number, shift, the part number, operation number, piece rate, order number, and other data on the punched cards.

The punched cards are then fed into the plant's data processing equipment to yield payrolls based on piecework, production progress reports, machine utilization reports, and other important data.

"The new system will make every man and every machine in a plant more effective," says Charles J. Lawson Jr., president of Hancock Telecontrol. "It will increase profit margins, and, in many cases, wages. It will eliminate much drudgery," he explains.

"Management cannot manage effectively without up-to-the-minute facts. Readout-Telecontrol gathers the facts and presents them in usable form with speed, accuracy and completeness. It takes the guesswork out of factory management."

"It shows management what was produced during a given period (from an hour to a day), what it cost, where there were delays, and which were the critical areas. It produces accurate data to compare with schedules.

Appropriate changes can be made so that objectives can be met," concludes Mr. Lawson.

For further information, *write* Hancock Telecontrol Corp., 320 Park Ave., New York, N. Y.

# Tube End Finisher Uses Abrasive Cloth

THE DIFFICULT job of deburring cutoff ends of rectangular and circular steel tubing is being performed by a Lo-Die tube end finisher developed by Lordstown and Behr-Manning.

The tubes, mostly mild steel, are loaded on a moving carriage. Ragged ends of the tubes are cut off by the two, 20 in., aluminum oxide wheels (60 grit).

Seven to nine pieces per minute pass between eight Vonnegut heads (indexing wheels loaded with 80 grit, aluminum oxide, abrasive cloth bonded with an all-resin adhesive). The cloth abrasive is slit from hub to outer edge at 1/4 in. intervals. Face width of the wheels is 4 in.

Heads are rotated at 1200 rpm. Alternate heads rotate in opposite directions.

Working width of the machine varies from 42 to 155 3/4 in. and is adjusted by a powered worm.

For further information, *write* Behr-Manning Co., a division of Norton Co., Troy, N. Y., or Lordstown Tool & Die Co. Inc., Warren, Ohio.

---

# Vacuum Feeder, Destacker Moves Corrugated Material

AN AUTOMATIC vacuum feeder and destacker has been designed to handle such jobs as the lifting, transferring, and stacking of corrugated material up to 20 ft in less than 10 seconds cycle time. Flat stock can be handled too.

The transfer unit, with a chain sprocket and ball bearing carriage, is completely self-contained and is powered by a compact air motor and reducer. Starts and stops are cushioned. The air motor is valved to act as a brake when the air supply is cut off. The company says setups have been designed for handling steel plates, structural steel, glass, aluminum, stone, concrete, and other nonporous materials.

For further information, *write* Vac-U-Lift Co., a division of the Siegler Corp., Salem, Ill.

# Friction Welding Machine Designed for Production

A FRICTION welding machine for production work will be introduced at the National Metal Exposition. The unit, Model 15-4, generally eliminates the need for fluxes and special atmospheres, reports the maker.

Capacity: 1 1/4 square in. weld area with 1020 steel, 1 1/2 in. diameter solid bar, and 2 in. OD tubing.

The unit has a two step pressure program with an axial thrust of 20,000 lb. Continuously variable spindle speeds range from 50 to 10,000 rpm. An electric clutch and brake are used with a 15 hp drive. The 3 hp hydraulic pump generates a maximum of 1000 psi.

See it at Booth 711, National Metal Exposition, Cobo Hall, Detroit, or *write* American Machine & Foundry Co., AMF Bldg., 261 Madison Ave., New York 16, N. Y.

## Ram Type Bending Brake Forms Flat Stock

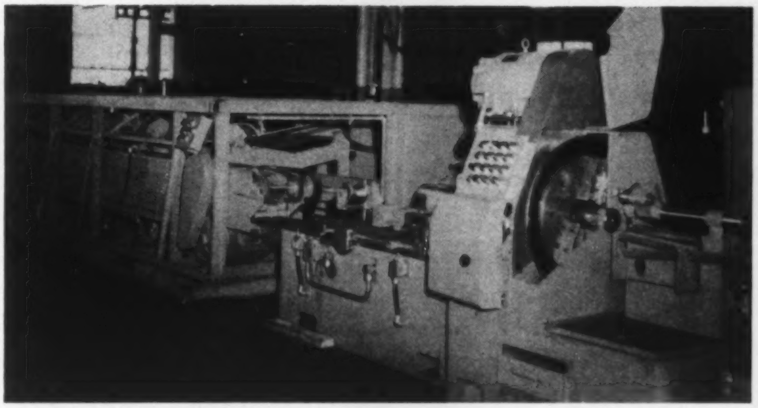
DESIGNED to form flat stock into a multitude of part shapes, a ram type bending brake offered by Pines has a capacity of up to 1/4 by 2 3/4 in. cold rolled steel and operates at speeds up to 50 cycles a minute.

The unit is powered by a self-contained, 7 1/2 hp, 2000 psi hydraulic system. The system acts through toggles to provide greatly multiplied bending force for the ram. A foot switch frees the operator's hand for fast, workpiece handling.

A pedestal type control station actuates the machine electrically.

The manufacturer says the offset, horizontal brake produces zero radius bends with consistent accuracy. Dovetail mounted tools slip easily into the ram and toolholder, speeding setup and changeover. The degree of bend is increased or decreased by a hand crank adjustment of the toolholder.

For further information, *write* Pines Engineering Co. Inc., 601 Walnut St., Aurora, Ill.



## Unit Feeds Tube, Pipe, Bar Stock

THIS UNIT automatically feeds tube, pipe, or bar stock into cutoff machines. It's shown coupled to an Etna Rotary cutoff unit. It can handle 20 ft tubing with a 3 in. maximum diameter.

Operation: After dropping a load of stock on four belts, the operator presses a button and the belts automatically wind up on the drums and evenly and accurately feed one tube at a time down a chute. Picked up by a Ferris wheel arrangement, the tubes are fed by a continuous chain conveyor into the collets or other chucking mechanism of the cutoff machine. The feeder can be made for practically any length or diameter of material.

For further information, *write* Clark Co., P. O. Box 316, Walbridge, Ohio.

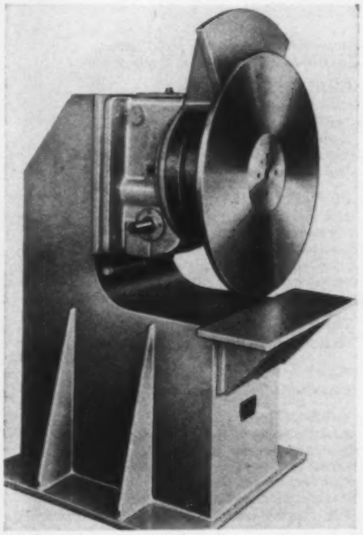
---

## Turret Type Indexing Unit Adapts to Many Operations

A TURRET type indexing machine chassis with a vertical indexing table is designed to facilitate tooling of sequential, automatic machine applications.

The unit, a modification of the standard Swanson Series B, uses a hardened, tool steel, crossover indexing cam that provides a cycloidal displacement cam path. Cams can be mounted on the main index camshaft extensions to actuate tooling mounting timing cams for electrical initiation of tooling sequences and for actuating auxiliary camshafts for additional tool motions.

The manufacturer says the unit is suitable for many types of assembling, processing, or testing operations requiring positive, mechanically actuated, intermittent motion in a vertical plane. You can get the self-contained chassis with a 20, 30, or 40 in. turret. A wide variety of index positions and work cycles are offered.



The chassis comes with an electric clutch-brake, limit switch, and tim-

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**WISCONSIN**
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Chain Belt Company, Milwaukee 1
Federal Malleable Company, Inc., West Allis 14
Kirsh Foundry Inc., Beaver Dam
Lakeside Malleable Castings Co., Racine
Milwaukee Malleable & Grey Iron Works, Milwaukee 46

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ing cam for cycle control and tooling interlock.

For further information, *write* Swanson-Erie Corp., 814 E. Eighth St., Erie, Pa.

## Woven Stainless Wire Resists High Temperatures

WIRE cloth woven from a high temperature stainless alloy, NS-A286, has been developed by Reynolds Div. National-Standard Co. The maker says the material has properties comparable to the more highly alloyed and exotic materials in the 600 to 1000° F range.

Parts made from the material can be hardened after forming or fabricating. Deep forming is possible. Tensile strength increases up to 73 per cent after heat treating. Various meshes, wire sizes, and weaves can be produced.

For further information, *write* Dept. RDT, National-Standard Co., Niles, Mich.

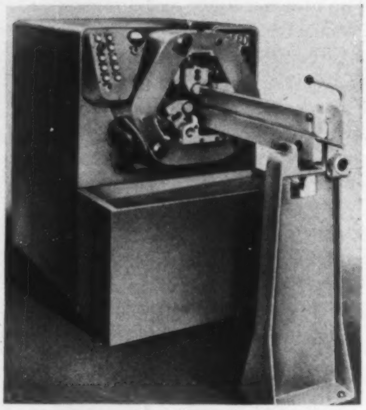
## Through Feed Rolling Unit Takes Variety of Tooling

SIMPLICITY and ruggedness are emphasized in the Reed, Model A25 through-feed thread and form rolling machine. In its simplified form, the unit has adjustable dieholders that remain in the rolling position for continuous through feed threading of long or short work.

For through feed rolling of work with shoulders, a hydraulic system is available for retracting the dies from the rolling position. The setup permits the work to be returned to the front of the machine for unloading.

The manufacturer says unit construction makes it possible to use a variety of tooling for special jobs, as well as general purpose threading.

The Reed, three cylindrical die principle is used with dies set at parallel or skewed axis. The principle provides self-centering of the work between the three dies (eliminating separate equipment to position and support the work relative to the axis of rolling).



The setup handles rolling loads up to 30,000 lb. Threads and forms $\frac{1}{2}$ to $2\frac{1}{2}$ in. in diameter are rolled in aluminum, brass, stainless, and a wide variety of alloy and heat treated steels. A 15 hp motor powers the unit. Eight standard die speeds (105 to 695 rpm) provide production rates ranging from about 6 in. per minute to more than 300 in. per minute.

For further information, *write* Reed Rolled Thread Die Co., 791 Main St., Holden, Mass.

## Instruments Check Height

A LINE of height setting, measuring, and comparing instruments has been developed by Brown & Sharpe. The units, called Hite-Mikes, are furnished with a 1 in. micrometer head, a 1 in. dial indicator, or a $\frac{1}{2}$ in. dial indicator.

Units consist of a 1.000 in. high base with chrome plated and lapped top surface (about 7 sq in.) and three lapped pads on the underside. A 6 in. high column holds five, 1 in., tubular, stainless steel gage blocks.

The micrometer head or dial indicators are held in a 1 in. (thick) yoke with chrome plated and lapped slides. The yoke can be inserted over any block on the column and may be positioned through 360 degrees. Yoke slides are 2 in. long to permit optimum clearance for work and tool. All three models can be quickly set at the desired height by loosening a knurled clamp nut at the top of the column, sliding the yoke over the gage block nearest the required height, and tightening the clamp nut. The units are

# Post-Forming: New Way to Bigger Savings with Malleable Castings

The ductility of Malleable iron castings permits use of high-speed forming techniques to finish Malleable parts at lower cost. Take advantage of the versatility you get only with ferritic and pearlitic Malleable castings. For a fuller understanding of how Malleable can help you, call any producer that displays this symbol —

Data Unit
MALLEABLE
IRON
CASTINGS

**Free Folder** describing these techniques is available for your use. Just ask any member of the Malleable Castings Council for Data Unit No. 116, or write to Malleable Castings Council, Union Commerce Building, Cleveland 14, Ohio.

MEMBER
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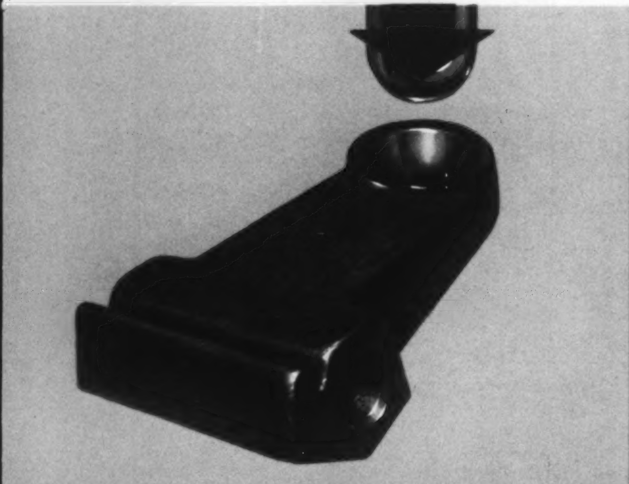
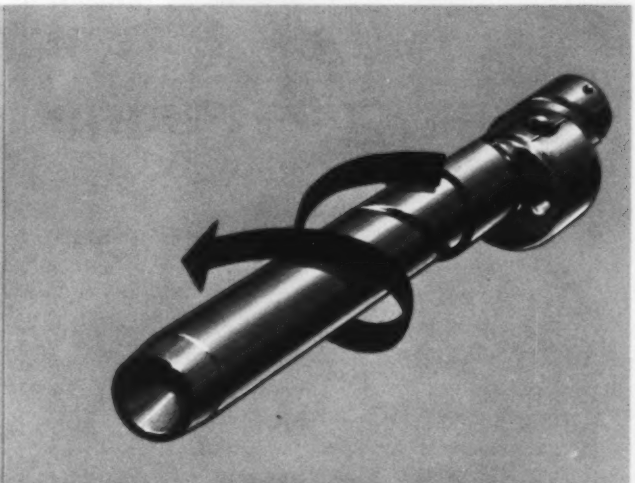
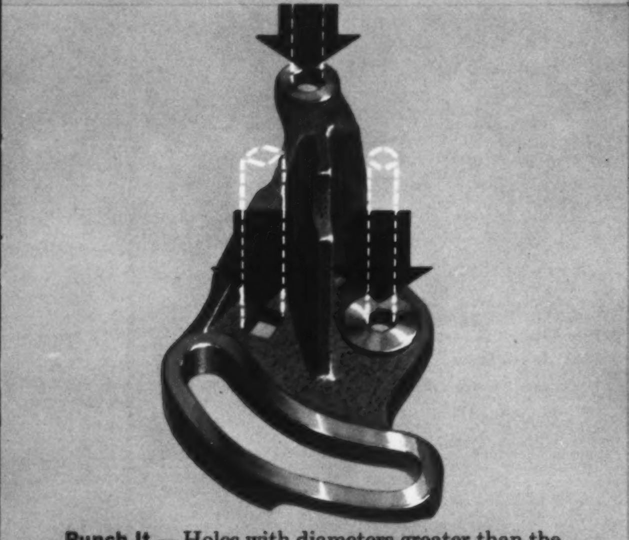
CASTINGS COUNCIL



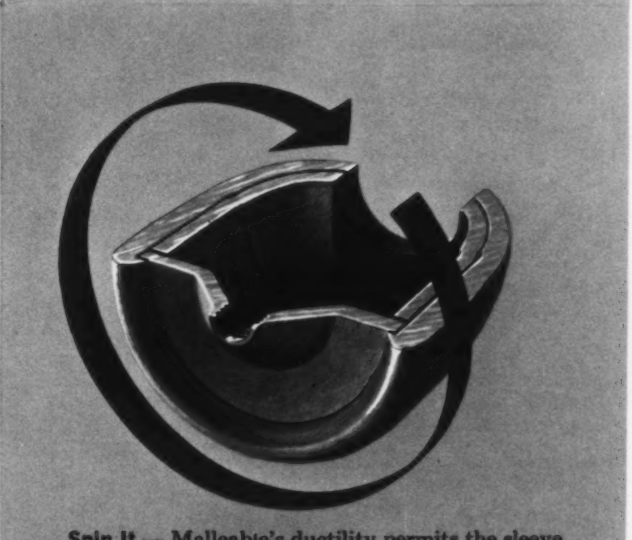
**Hot Form It** — Hot coining this Malleable transmission part reduces finished cost . . . eliminates three cutting operations required by the previously used steel part.



**Roll It** — Oil grooves in lawnmower crankshafts and splines in compressor crankshafts are just two of many places where rolling proves more economical than machining.



**Punch It** — Holes with diameters greater than the thickness of the metal can be punched in Malleable. Two round holes and a square hole are punched simultaneously in this idler arm.



**Spin It** — Malleable's ductility permits the sleeve and end disc in this ball joint to be held in place by spinning the Malleable housing into a strong, permanent flange.

TOCCOTRON
TOCCOTRON

# Now TOCCO Offers RF INDUCTION HEATERS from 5 to 300 kw output

For almost 20 years TOCCO has built and sold electronic, tube-type induction heaters, but now we can offer a wider range of sizes than ever before to meet every RF heating requirement. TOCCOtron units are available with a nominal frequency of 450,000 c.p.s. or, for very high frequency applications, 4 megacycles. All are dependable, rugged production machines—*not* fragile laboratory instruments which are difficult and expensive to maintain.

*50 kw 450,000 c.p.s. TOCCOtron unit. Other units available with 5, 10, 15, 25, 60, 100, 150, 200 and 300 kw output.*

## *Check these advantages:*

- ☐ The industrial heavy-gauge steel cabinet which completely encloses all high potential circuits preventing radiation interference and personnel hazards.
- ☐ Meters in all sensitive circuits to enable the user to obtain the maximum output and efficiency.
- ☐ High KVA tank circuits and adjustable plate voltage, grid bias and grid drive controls where desirable, allow easy matching to all loads.
- ☐ Externally mounted circuit breaker and disconnect located so that it is easily accessible. JIC type enclosure which separates all control components from the high voltage circuits.
- ☐ Integral water systems available in most models—saves floor space and water consumption.
- ☐ Gasketed, lockable doors allow easy accessibility to all components. JIC type enclosure cooled with air to water heat exchanger.

Because TOCCO makes both audio frequency equipment (motor-generator sets) and radio frequency equipment (electronic tube-type units as shown), you can always count on a completely unbiased equipment recommendation—the right equipment for your particular heating job.

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**Dept. S-10, Cleveland 5, Ohio**

Please send literature describing TOCCOtron Radio Frequency Induction Heating Equipment.

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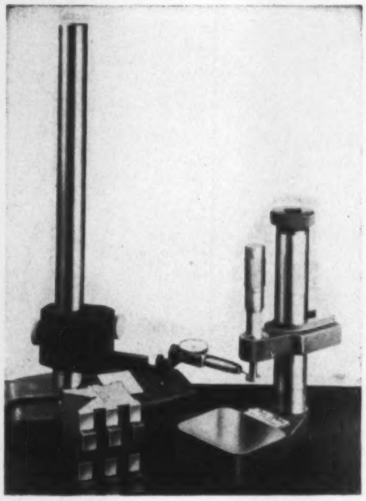
Address____________________
City____________________Zone______State__________



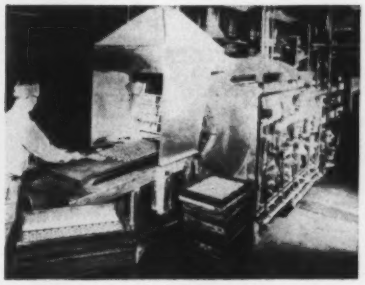
self-checking (using either the base working surface or a surface plate for zero reference).

For further information, *write* Industrial Products Div., Brown & Sharpe Mfg. Co., Providence 1, R. I.

## Furnaces Designed for Sintering, Infiltrating

A LINE of mesh belt sintering furnaces (17 models) has been introduced by Harper Electric. Designed for sintering and infiltrating, the furnace is said to include several unique features for positive counterflow of atmosphere gas, proper disposal of volatiles, easy ash removal, quick duplication of belt speeds, and accurate control of temperature profile.

After being placed on a mesh belt, green compacts move through a volatile burnoff chamber, a volatile vent chamber, a high heat chamber, and a water jacketed cooling chamber. An insulated (or water jacketed) precooling chamber can be located between the high heat and cooling chambers.



Strains within the pressed compacts are relieved gradually. Strategic distribution and control of the heat source give desired heatup and maximum soak time at uniform temperature in the burnoff and high heat chambers. Heating chamber lengths range from 3 to 11 ft, mesh belt widths from 6 to 36 in. Burnoff and high heat chambers can be gas fired or electrically heated (including combinations).

For further information, *write* Harper Electric Furnace Corp., 110 Pearl St., Buffalo, N. Y.

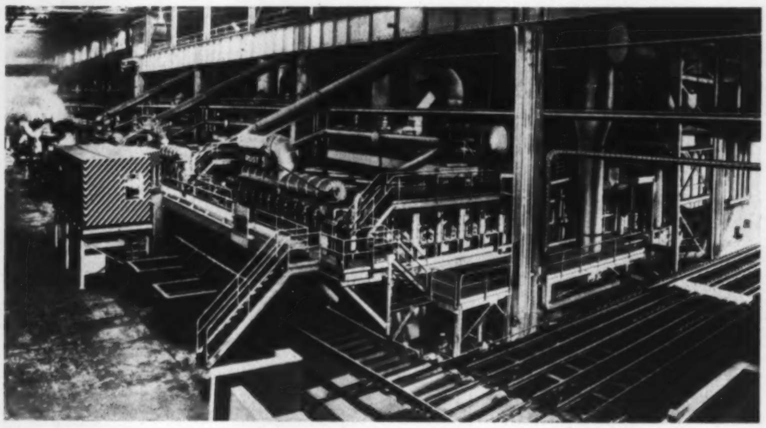
## Design Changes Improve Spring Making Machine

SEVERAL design changes have been incorporated in the Spring-Generator made by Baird Machine. Most of them involve coiling conditions within the unit. An improved feed offers more time for coiling (makes for easier cam motions and smoother operations).

The tool cams and toolholders have also been redesigned to make the machine more flexible. The face plate is coated to kill light reflection for operator comfort. More accurate wire feeding is a benefit of brake redesign.

Frank C. Holmes, vice president states: "The design changes do not alter the basic abilities of the machine. Generally, the changes mean a smoother working machine, longer machine life, and easier maintenance."

For further information, *write* Baird Machine Co., 1700 Stratford Ave., Stratford, Conn.



## Three 105 ft Furnaces Installed for Strip Mill

THREE, identical, slab reheating furnaces (each has five zones) have been designed and installed for Bethlehem Steel Co.'s 56 in. hot strip mill at Sparrows Point, Md. Each furnace has an effective length of 105 ft.

Design features: Instrumentation with miniature controls and graphic panel boards, a work platform setup using turntables for easy material handling, and four Rust-Escher metallic recuperators serving each furnace.

The manufacturer used an electronic computer in the design of the recuperators.

For further information, *write* Rust Furnace Co., 930 Fort Duquesne Blvd., Pittsburgh 22, Pa.

## Offers New Materials for Magnetic Particle Testing

A FAMILY of materials for the wet method of visible and fluorescent magnetic particle testing is offered by Magnaflux. The materials, called concentrates, are in powder form

Linde "Total Gas Technology" guarantees your oxygen supply...

Lancing in electric furnaces calls for a dependable supply of oxygen.

# WHERE BACK-UP MEANS GO

Today's steel mill cannot live without oxygen. That makes back-up of supply vital. Supplemental oxygen is needed, too—for peaks, for emergency use, for full-scale tests. ✦ Every LINDE customer is backed up by a supply system that includes more than 90 liquid oxygen producing, storage, and distribution plants, and a fleet of railroad tank cars and tank trucks. Total liquid storage capacity is over 30,000 tons at LINDE plants, with tens of thousands of tons more in the field. ✦ But this is only part of "Total Gas Technology"—LINDE equipment, processes, service, research; all are helping steel sell by reducing the cost of production *and* fabrication. *Note two more examples at right.*

"LINDE," "UNION CARBIDE," "DRIOX," "OXWELD," AND "UNIONMELT," ARE REGISTERED TRADE MARKS OF UNION CARBIDE CORPORATION, AND USED BY ITS DIVISION, LINDE COMPANY, 270 PARK AVENUE, NEW YORK 17, N. Y.

Steel costs lowered by modern technology

**New OXWELD C-66 cutting torch**—cuts up to 30 in. with natural gas as fuel. Field operations have shown savings up to 15% in operating costs.

**UNIONMELT Submerged Arc** welding "double-joints" 24-in. diameter steel pipe into 60-ft. lengths at the pipe mill, speeds major pipeline construction.

FORWARD

LINDE COMPANY

UNION CARBIDE

and have features superior to the previous Magnaflux and Magnaglo pastes. They are easier to mix, handle, and store. The company indicates an increase in fluorescent brilliance of 70 to 600 per cent and other advantages, such as closely controlled particle size range, less foaming, and more corrosion protection.

The series consists of eight different materials—four for the visible red or black Magnaflux method and four for the more sensitive fluorescent Magnaglo technique.

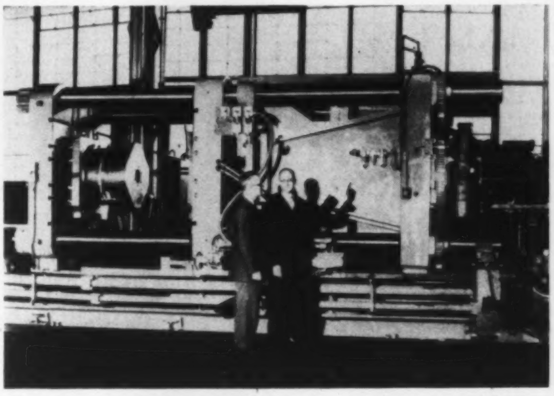
Some of the concentrates are formulated for oil suspensions, others for water. Each has different characteristics related to particle size, magnetic properties, and color contrast, and concentrations.

The company says a noteworthy feature is the ease with which a magnetic particle test bath can be prepared. The concentrates can be added directly to the oil after measuring the proper amount in a graduated cup. A uniform suspension is obtained almost immediately.

For further information, *write* Magnaflux Corp., a subsidiary of General Mills, 7300 W. Lawrence Ave., Chicago 31, Ill.

## Unit Diecasts Aluminum Blocks

THE DIE platen on the Kux diecasting machine measures $5\frac{1}{2}$ x 7 ft, with nearly 5 ft of die clearance between the tie bars. The high pressure hydraulic system uses a 50 hp motor to generate power requirements for casting 60 lb of molten aluminum per machine cycle under injection pressure of 12,500 psi. Velocity is 150 in. per second.



The unit, Model HP-1300, can go through its complete cycle of full stroke of die platens and injection in 11 seconds. The unit has a 32 in. die separation stroke.

For further information, *write* Kux Machine Co., 6725 N. Ridge Ave., Chicago 26, Ill.

(*Please turn to Page* 92)

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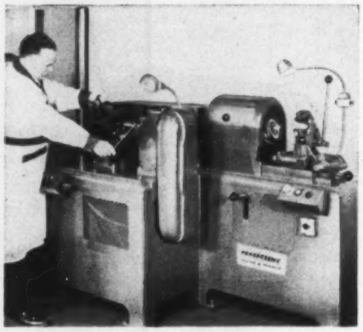
*(Concluded from Page 91)*

## Production Flaring Unit Handles Many Metals

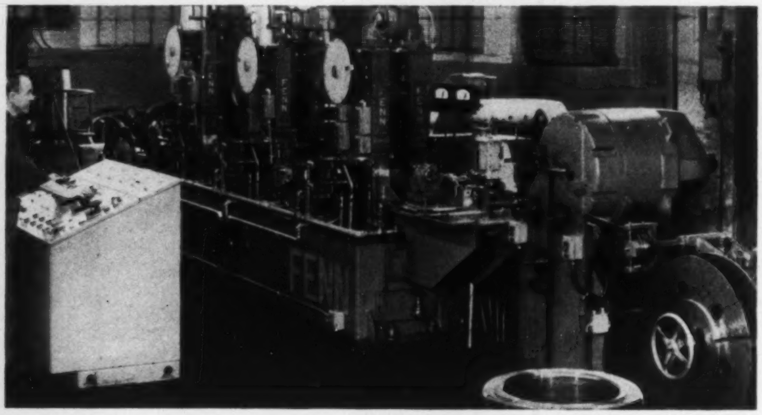
YOU can do production trimming, squaring, chamfering, and flaring of standard aluminum, mild steel, stainless, bronze, copper, and exotic metal tubing with a precision unit designed by Progressive Welder & Machine Co.

The two station setup is designed for use on standard tubes with $\frac{3}{8}$ to $1\frac{1}{2}$ in. OD and 0.028 to 0.049 in. thick walls. Station No. 1 trims and squares the tube end, chamfering the inside, and outside diameter. Station No. 2 flares the tube within commercial tolerances.



Tubes are securely clamped in position during the centrifugal action of trimming, squaring, chamfering, and flaring. The drive motor speed and the duration of the flaring cycle are adjustable during operation. Variations of the unit are available.

For further information, *write* Progressive Welder & Machine Co., 915 Oakland Ave., Pontiac, Mich.



## Mill Tailors Spring Steel

THIS wire flattening mill produces tailormade spring steel at speeds up to 3100 fpm. The unit (Model 082-062-062) has three stands on a common base. The first stand is equipped with 8 in. diameter carbide shell rolls. The second and third have 6 in. diameter carbide shell rolls.

Other features include a ten roll, friction straightener on the entry side of the first mill stand; electric screwdown on all stands; internal and external coolant supplied to mill rolls and coolant troughs from a common reservoir in the mill bed; automatic, self-contained lubrication system; Pratt & Whitney width and thickness gages (mounted at the exit side of the last stand); and friction edgers with power operated adjusting screws between the stands. A pneumatically operated system handles 1000 lb coils at the take-up and repass reels.

Each stand is driven by a 75 hp, direct current motor. The setup is operating at Wallace Barnes Steel Div., Associated Spring Corp., Bristol, Conn.

For further information, *write* Fenn Mfg. Co., Newington, Conn.

# stainless

because no other
metal will do
the job as well—

stronger
handsome
ever-bright
non-corrodible
easy to clean

thanks to

# Superior

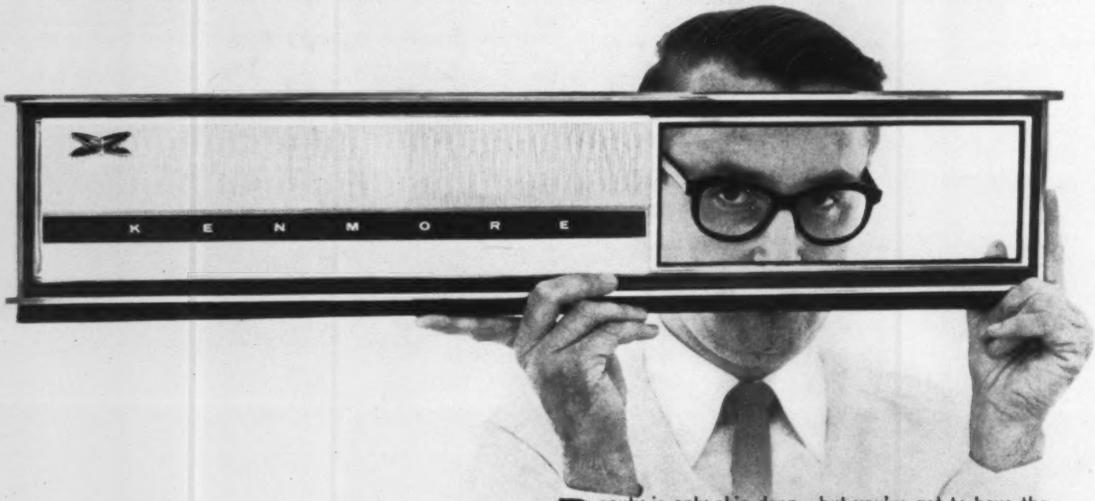
STAINLESS STRIP STEEL

Your fire extinguisher with the stainless body features a very good reason for being ever-ready for service: stainless steel is the *changeless* metal — good as new, year after year, without costly maintenance. ● Made of SUPERIOR Stainless Strip Steel, the extinguisher body is easy to draw and weld—always uniform in behavior and performance because of uniformly Superior quality, coil after coil. Let us quote on your stainless requirements.

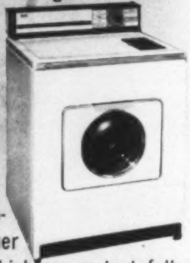
**SUPERIOR STEEL DIVISION**
OF
COPPERWELD STEEL COMPANY
CARNEGIE, PENNSYLVANIA

For Export: Copperweld Steel International Company, New York

# "Are you getting your metal's worth?"



Beauty is only skin deep—but you've got to have the right kind of skin to begin with. Take this stylish zinc die cast control panel housing used on the Kenmore combination washer-dryer. Without the castability of Zamak you wouldn't be able to achieve the detailed decorative design and lettering cast in the smooth surface. And only the surface of a zinc die casting enables you to draw on the wide variety of finishing techniques—chrome plating, gold lacquer and white and charcoal enamel—which are so tastefully combined. • This panel housing is not a fragile beauty either. It has to be strong to endure a life filled with daily vibrations as the family laundry gets done. Design and production men are not easily charmed—they tried an anodized aluminum stamping—but they found it "too flimsy and not sharp looking." So much for that romance. • There are also some attractions related to this panel which are more than skin deep—the beauties of high production and interchangeable parts. Du-Wel Metal Products of Bangor, Michigan can consistently turn out up to 3000 of these castings a day, with variations in the right control box for different models of the washer-dryer. • **Remember—Zamak gives you more for less. Are you getting your metal's worth?**



**NJZ**

HORSE HEAD PRODUCTS

**THE NEW JERSEY ZINC CO.**
160 FRONT STREET • NEW YORK 38, N. Y.

# NEW Literature

Write directly to the company for a copy

### Metal Braid Applications

Latest applications, standard terminology, and types of tubular and flat metal braid constructions are described and illustrated in a tubular braid brochure, TB301. Dept RDT, National-Standard Co., Niles, Mich.

### Machinery Mounts

Advantages of machinery mounts are emphasized in a folder published by Barry Controls. Barry Controls Div., Barry Wright Corp., 700 Pleasant St., Watertown 72, Mass., or 1400 Flower St., Glendale, Calif.

### Control Center Planning

The Monitrol handbook is a guide for laying out and designing special or standard control centers. A time saving worksheet and application guide are included. Monitor Controller Div., Atlee Corp., 99 Grove St., Rockland, Mass.

### Hard Surfacing Powder

A two page data sheet (No. T-5) describes Colmonoy No. 75, tungsten carbide, hard surfacing powder. Properties and applications are discussed in detail. Wall Colmonoy Corp., 19345 John R. St., Detroit 13, Mich.

### Brazing Stainless Steel

Joining stainless steel by brazing is a subject of a 4 page bulletin. Handy & Harman, 850 Third Ave., New York 22, N. Y.

### Packaging System

General guidance in solving difficult packaging problems is provided by a packaging and material handling manual. It includes an explanation of a suspension system designed to minimize and distribute impact shock uniformly over the surface of a package. Herculite Protective Fabrics Corp., 661 Fourth St., Newark 7, N. J.

### Conveyor Ideas

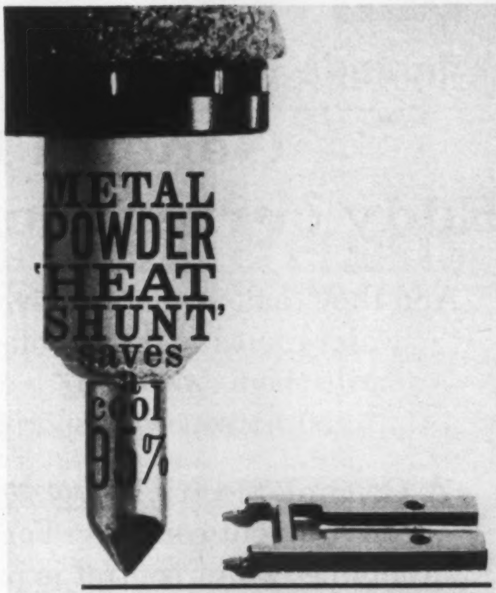
A second issue of a 4 page picture brochure dramatizes new ways to cut costs with conveyors. Standard Conveyor Co., North St. Paul 9, Minn.

### Use of Extrusions

Issue No. 18 of *Extrusioneering News* discusses how the extrusion process has been used in the development of aluminum fuel elements for atomic powerplants. Precision Extrusions Inc., Bensenville, Ill.

### Machining Problems

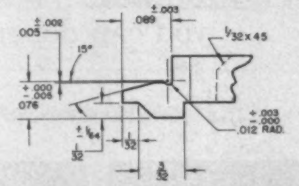
The solution of problems with special machines is discussed. One account tells of transfer machine fixturing with 1000 dimensions held to a 0.0002 in. limit. Ask for the current issue of *Allen Tool Tidings.* Allen Tool Corp., Box 1382, Syracuse 1, N. Y.



The heat shunt shown above is pressed from pre-alloyed bronze powder and hard-chrome plated. It is used to position electronic components on printed circuit boards and eliminate heat damage when soldering.

Design teamwork between Kwikset Powdered Metal Products and Autonetics Division of North American Aviation has resulted in a part which is produced at a 95% cost saving over previous machining methods.

The heat shunt is easily produced in four precise end modifications to locate components at various angles. When soldering, the high heat conductivity of the bronze protects the components and circuit from melting by drawing off heat produced at the solder joint. The heat shunt itself is solder-proof thanks to its hard-chrome plate.



This time-saving printed circuit tool demonstrates that, working together, the metal powder fabricator and his customer can lick the hottest problem. To find out how to put nonferrous powder metallurgy to work for you, write today to the New Jersey Zinc Company, producers of nonferrous metal powders setting tomorrow's standards today.

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# General Electric Makes Eddy-current-coupling Drives

And they're dependable drives. The complete line includes water-cooled and air-cooled eddy-current couplings. We call them **KINATROL*** drives. Ratings are from 1 to 150 horsepower, operating from standard a-c power.

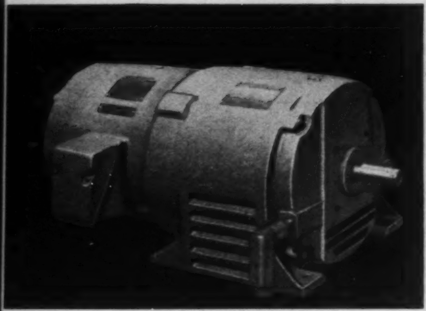
A General Electric **KINATROL** drive is not just another eddy-current coupling. For instance, in the water-cooled coupling, water control is packaged. You'll see much less external piping. Furthermore, the coupling is protected from flooding—and the air gaps are dry, preventing corrosion.

**KINATROL** couplings are compact, field proven and dependable. General Electric has had a good deal of experience in the engineering, manufacturing, and application of packaged adjustable-speed drives. And we know how important service is to a customer.

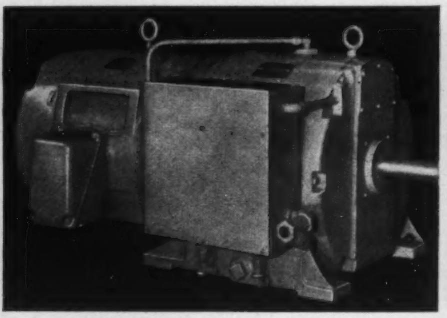
**KINATROL** —a good product, with the kind of service you can depend on. Please call your nearest General Electric Sales Office for further details.

**Trademark of General Electric Company*

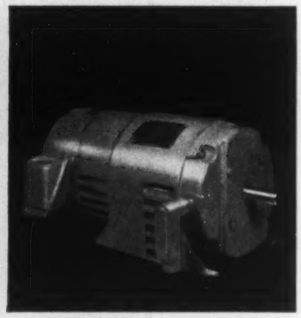
821-07



AIR COOLED, 7-1/2 to 100 HP



WATER COOLED, 25 to 150 HP



AIR COOLED, 1 to 5 HP

DIRECT CURRENT MOTOR AND GENERATOR DEPARTMENT

GENERAL ELECTRIC

ERIE, PENNSYLVANIA

# Sidewise Trend Persists

BARRING a sharp pickup in auto production or a sudden shift toward inventory building, steel demand seems destined to stay at the current level the rest of the year.

Steelmakers are shipping finished products at a rate that equals or slightly exceeds consumption—and consumption isn't likely to change much unless there's an automotive boom. A moderate increase in auto steel demand will merely offset seasonal downtrends that have already started in other markets—construction, canmaking, railroad trackwork, and agriculture.

**AUTO STRIKES HURT—** Automotive steel buying has, of course, been curtailed by the strikes against General Motors Corp. and Ford Motor Co. By mid-October, the labor troubles had trimmed 1962 model output by an estimated 240,000 assemblies. October production will be about 485,000 cars if: 1. Chrysler Corp. isn't struck. 2. Ford doesn't go into extensive overtime production to make up for output lost during the strike.

Automakers aren't releasing much steel because they have more than enough on hand and in transit to meet their October schedules. In the early stages of the strikes, they allowed their suppliers to continue shipping. When they went back to work, steel came in faster than they could use it. To prevent their inventories from piling up, they asked the mills to defer some of their October shipments until November. Result: They aren't ordering as much new steel for next month as the mills originally expected.

**ASSEMBLIES TO INCREASE—** If new model sales are up to expectations, automakers will probably boost their output to 600,000 cars next month and build the same number in December. Fourth quarter production would then be close to 1.7 million cars—about the same volume as the industry turned out in the fourth quarter of 1960. That's probably not enough automaking to boost steel demand materially. Steelmen are hoping that if new car sales maintain their record pace of early October (which may have reflected nothing more than early introductions), automakers will increase their fourth quarter schedules.

**NO STOCKPILING EXPECTED—** If steelmaking continues at the current level for the rest of the month, the industry's October shipments will be about 6.3 million tons. That's about the amount of finished steel which market analysts expect users to consume during October. Unless there's a dramatic increase in automotive steel use, shipments and consumption will probably stay balanced at about 6.3 million tons a month during November and December. There will be no need for steelmakers to boost their ingot production unless users start building inventories. The odds are against stockpiling because deliveries are still prompt and are expected to stay that way.

**IMPORTS CLIMBING—** At 307,000 tons, August imports of steel mill products were the largest of any month since April, 1960. They more than doubled our exports of 150,000 tons. During the first eight months of the year, we imported 1.9 million tons and exported 1.2 million tons. Look for imports to exceed exports by about 400,000 tons during the fourth quarter.

**PRODUCTION STEADY—** Look for ingot production in the week ending Oct. 28 to be about the same as the 2,050,000 tons that STEEL estimates the industry poured in the week ended Oct. 21. Output then was 1 per cent below the previous week's.

## WHERE TO FIND MARKETS & PRICES

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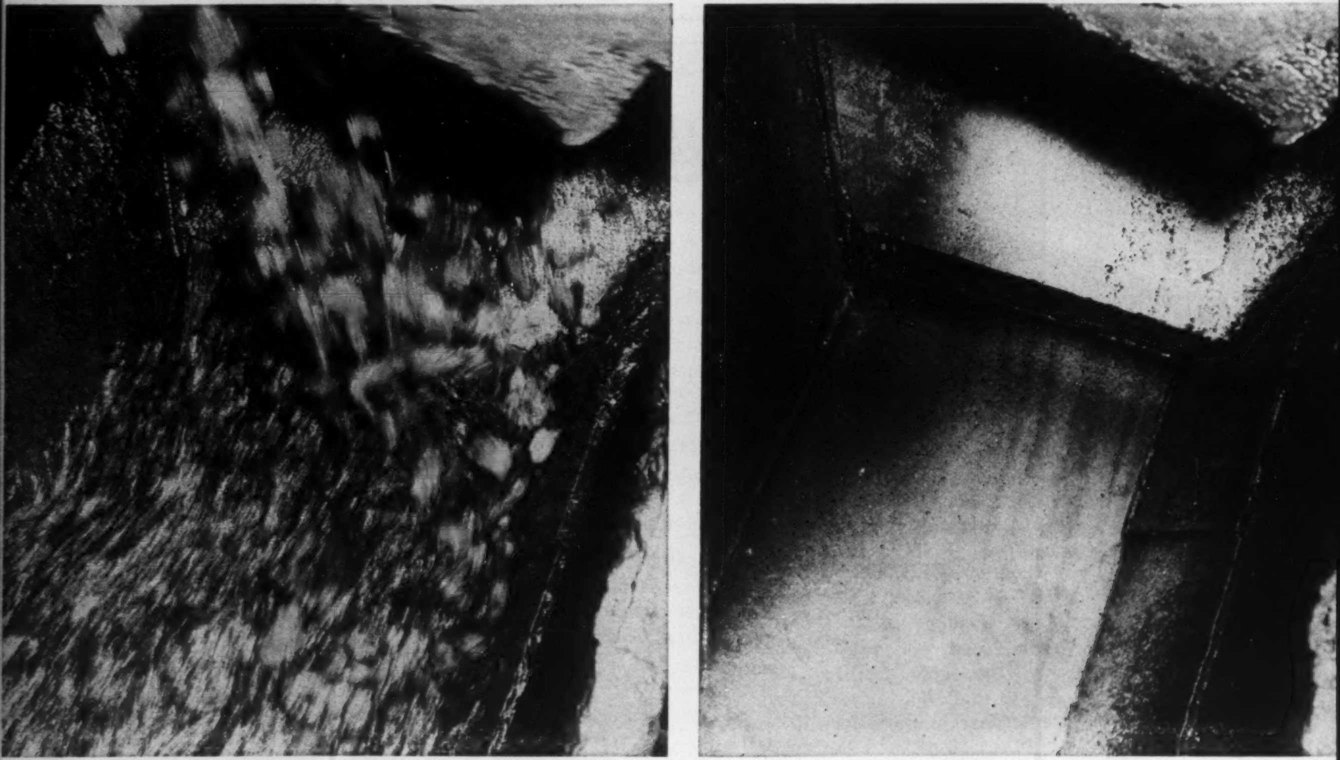
*Current prices were published in the Oct. 16 issue and will appear in subsequent issues.

***Now* you can get USS "T-1" Steel from Steel Service Centers coast to coast**

Processing plant of Oriole mine. USS "T-1" Steel pays dividends in longer chute life, under the grinding action of coal and rock.



# Chutes of USS "T-1" Steel outlast others 3 to 1

Coal and rock scraping across a piece of metal are highly abrasive. At the Bell and Zoller Coal Company's Oriole Mine near Madisonville, Kentucky, gravity chutes lasted about three months.

Oriole switched to USS "T-1" Steel furnished heat treated to a minimum hardness of 321 Brinell. In this harder condition "T-1" Steel offers maximum resistance to impact abrasion, yet retains toughness and weldability. These new chutes lasted nine months to a year. The extra cost of "T-1" Steel was wiped out almost immediately by the sizeable saving in the costs of material and fabrication, and by the extended life of the new chutes.

Now, USS "T-1" Constructional Alloy Steel, at 321 minimum Brinell, is used for all sluice and refuse chutes in the Oriole processing plant. More than 3,400 tons of coal and rock go banging and clanging down the chutes daily. Despite impact, abrasion and corrosion, the ⅜-inch-thick plates of "T-1" Steel stay smooth and clean. Coal doesn't clog the chutes.

**Other uses where "T-1" Steel saves money.** Shovel buckets can be built larger and lighter to scoop more load; truck bottom plates take more battering when made of "T-1" Steel and last longer. Continuous miner front ends, conveyors, vibrator frames—all take punishment better and reduce maintenance costs when made of USS "T-1" Constructional Alloy Steel.

USS "T-1" Steel and the new lower priced "T-1" type A Steel can be furnished to a minimum yield strength of 100,000 psi, or a minimum hardness of 321 Brinell, depending on application. USS "T-1" Steel can also be furnished to 360 Brinell. All of these tough, weldable steels can reduce weight and increase the strength and life of your equipment. Call your local Steel Service Center for more information. Or, for the name of the distributor of USS "T-1" Steels nearest you, write to United States Steel, 525 William Penn Place, Pittsburgh 30, Pa. USS and "T-1" are registered trademarks.

United States Steel Corporation • Columbia-Geneva Steel Division • National Tube Division • Tennessee Coal and Iron Division • United States Steel Export Company

**USS United States Steel**

# Prices on Imported Steel Slip

**Where will the steel from this white hot ingot go? The German mill where the photo was taken and other foreign mills find that an increasingly difficult question to answer. Growing foreign steelmaking capacities are making more steel available on the world market. A current result: Price reductions on steel imported into the U. S.**

RISING world steelmaking capacity is reflected in lower prices on imported steel products in the U. S. market. Prices on imports from Western Continental Europe are generally easier. A few are unchanged, only one (furring channels) is up. (Prices on Page 116.)

Importers partially attribute the easiness to less buying pressure, both here and abroad, but expanding steel capacity abroad is a big factor. It has resulted in stiffer competition among leading producing areas, and it is tending to limit the outside purchases of many countries formerly almost wholly dependent on imports. They are building steelmaking capacity of their own.

**• Seasonal Slump**—With winter approaching, European steel consumers are tapering off their purchases. In this country, few orders are being booked by the importers for shipment to Great Lakes ports. That's because the lake shipping season is drawing to a close, and orders placed now can't be delivered before next spring.

Some importers think the decline in prices has about reached bottom. They point out that the quotations on imported wire are fairly steady, with volume reasonably sustained. However, foreign mill representatives in the Southwest have been expecting a price decline for some time, and despite some rather wide spreads between prices quoted on foreign and domestic products, foreign sales continue to lag. Imports into Texas during September were estimated at 35,000 tons, off 10,000 tons from the August total.

**• Volume Down**—Imports of stress relieved strand should be off little from the 1960 volume, say domestic producers. They estimate imports this year will run close to 16,000 tons against 16,200 in 1960. At least 75 per cent of the tonnage will come from Japan and 12 to 15 per cent from Italy, say domestic steelmen.

Consumption, it's estimated, will run slightly higher than it has in any preceding year—possibly between 50,000 and 60,000 tons vs. the previous peak of 50,000 in 1959. Imports of stress relieved strand began to show up in 1957—1700 tons, against 22,000 tons consumed in this country. In 1958, imports were 7100 tons and consumption 33,000; in 1959, 21,400 tons were imported, with consumption running around 50,000 tons; and in 1960, imports amounted to 16,200 tons and consumption 43,000.

**• Imbalance Shown** — As pointed out in STEEL (Oct. 16, p. 191), steel exports have skidded this year, the total for the first eight months being 1.2 million tons, valued at

$266.6 million. In the same period of 1960, the total was 2.1 million tons, valued at $425.8 million.

This country is importing about 50 per cent more steel than it is exporting, and there's little chance for the trend to be reversed soon. In fact, competition from foreign steel promises to intensify. Foreign producers are under increasing pressure to find outlets for the output of their expanded producing capacity.

## Sheets, Strip . . .

**Sheet & Strip Prices, Pages 109 & 110**

Specialties are moving better than the hot and cold rolled grades of sheets. Galvanized sheets and coated specialties are in active demand—deliveries extend into the closing weeks of the year. Shipments of enameling stock and electrical sheets are a little tighter than they have been in recent weeks, running late November and early December.

Some producers of galvanized sheets now have little tonnage to offer for delivery before mid-December. Demand for hot and cold rolled sheets shows a little improvement, but there's no real push in the market, and, in general, delivery promises are about the same as they have been for some time—two to three weeks on hot rolled and two to five weeks on cold rolled.

Sheetmakers are encouraged by the settlement of the Ford strike, but inventories at auto plants are reportedly heavy, having been built up during the recent labor trouble. As a result, the outlook for fourth quarter demand is not as bright as it was.

## Tin Plate . . .

**Tin Plate Prices, Page 110**

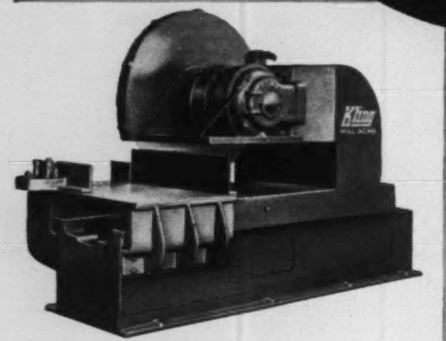
Orders for tin plate in the fourth quarter are likely to be the poorest of any quarter this year. But shipments of tonnage on order will be substantial.

American Can Co. is closing its plant at Sacramento, Calif. It was opened in 1927 and has been operating below capacity for a number of years because of the consolidation of local production in other California plants. Ninety-two employees will be affected.

Kling

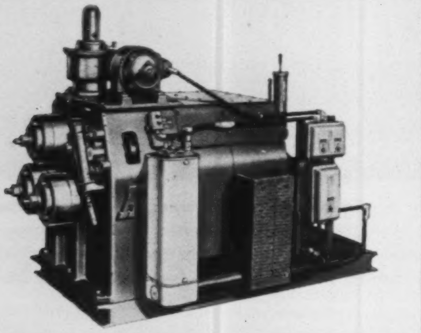
METAL WORKING TOOLS

*Representative items of a full line*



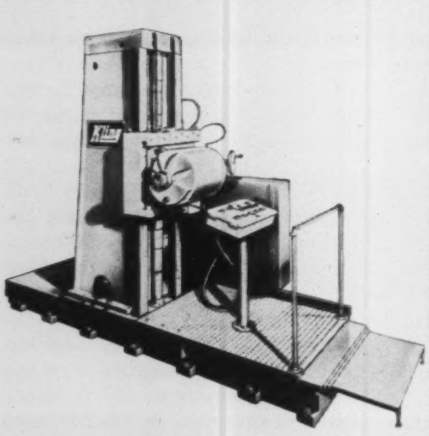
**"KLING" FRICTION SAWS**

Permit faster cutting of varied structural shapes as well as solid or hollow bars in any sequence without changing the blade or set-up. Made in several sizes and models for high speed production operations. (Bulletin 4200)



**"KLING" NO. ½-A PYRAMID ANGLE ROLL**

For forming angles, channels, beams, bars (on edge or flat) with self feeding feature and heavy guide rolls to prevent twisting. Available in a wide range of machine sizes and capacities. (Bulletin AR-600)



**"KLING" STRUCTURAL MILL**

For face milling of steel sections, plates, forgings and castings up to 60" per minute. Will handle the largest work pieces. 30 HP, 40 HP or 75 HP milling motor and simplified controls permit fast metal removal. (Bulletin MA-1)

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**THE HILL ACME COMPANY**

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Cleveland 2, Ohio**

## Shipments of Tin Cans in August Score Sharp Gain

The movement of tin plate cans in August totaled 632,152 tons vs. 471,553 in July, reports the Census Bureau. It brought the total for the first eight months of this year to 3,318,406 tons compared with 3,178,539 tons in the like 1960 period. Base boxes of tin plate consumed in August totaled 13,697,891 against 10,230,958 in July.

Shipments of fruit and fruit juice cans in August amounted to 120,511 tons vs.87,556 tons in July, bringing the total for the first eight months to 489,445 tons. That's down from 502,973 tons in the same period last year. Base boxes consumed in August totaled 2,578,948 compared with 1,873,693 in the previous month.

The movement of vegetable and vegetable juice cans totaled 188,002 tons against 89,344 tons in July. The cumulative total for the first eight months was 560,098 tons compared with 468,381 tons a year ago. Base boxes consumed in August totaled 4,023,249 compared with 1,991,963 in July.

Shipments of beer cans in August amounted to 89,704 tons against 98,392 tons in the preceding month. The movement during the first eight months was slightly below the 1960 pace, amounting to 598,337 tons vs. 606,418. Base boxes consumed in August totaled 1,847,901 compared with 2,026,870 in July.

Aluminum can shipments in August involved 1656 tons against a revised total of 1601 tons in July. Shipments for the first eight months were up sharply from the corresponding period a year ago, 21,418 tons vs. 13,246 tons.

## Steel Bars . . .

**Bar Prices, Page 108**

Minor changes are incorporated in revised extra cards (dated Oct. 16) issued by Republic Steel Corp. They cover hot rolled carbon steel bars and small shapes (merchant and special quality).

Commercial steel bar business is spotty, but the over-all trend seems to be downward, despite some pickup in automotive needs. Both hot rolled and cold drawn are involved.

why are these
Townsend parts
called ultra-special?

We call the metal parts shown here Ultra-Special because they are the result of completely new cold-forming and finishing techniques. They are typical examples of how users are reducing costs by taking advantage of the strength, improved quality, close dimensions and economy of mass-producing parts by cold-forming.

In the past, the limitations of the cold-forming process forced manufacturers to accept parts which were made by other, more costly methods. Now, through extensive research and development work Townsend is cold-forming Ultra-Special items with intricate shapes and critical dimensions held to tolerances as close as .001 inch. They may be made by combining cold-heading processes with impact extrusions, special heat-treatment and coatings, to name but one of the new techniques.

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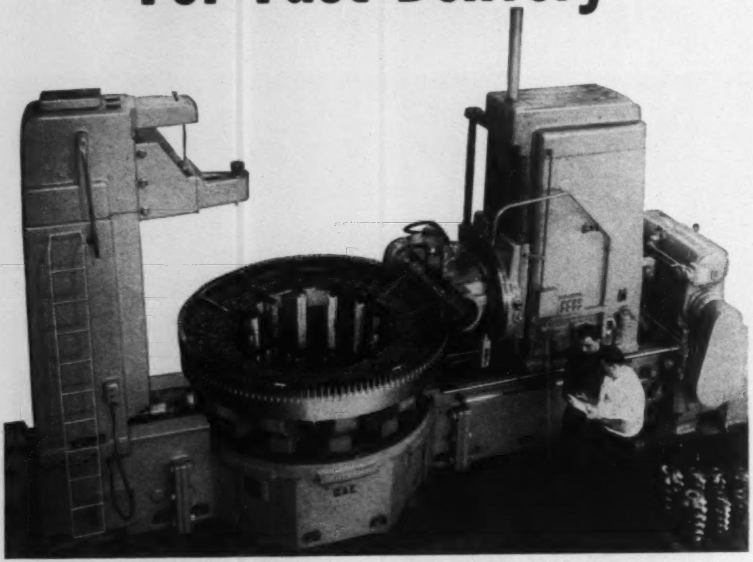

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Gears which must operate smoothly and without vibration at higher speeds and under greater loads must correspondingly be more accurate in tooth profile and spacing.

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Offering the same high-quality standards which characterize the complete H & S Gear line, production capacities for large generated Spur, Helical and Hobbed-Herringbone Gears are now available in the following dimensions:

Up to 80" outside diameter at 1 DP
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Up to 100" outside diameter at 1½ DP
Up to 125" outside diameter at 2 DP
Face widths up to 42", depending on helix angle

Send your specifications, or let our technical staff make recommendations. H & S specializes in fast production of quality industrial Gearing and Speed Reducers to meet your custom requirements.

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AGMA

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Cold drawers look for little improvement in demand this month. They can offer tonnage for shipment as quickly as ever—one to two weeks on the carbon grades and two to three on alloy material. Hot carbon stock is still available within two to four weeks, depending on rolling schedules. Demand for hot bars in New England is reported to be at the highest point of the year.

In a move aimed at improving the quality and usefulness of its specialty products, LaSalle Steel Co., Chicago, has narrowed the tolerances on its Fatigue-Proof, "e.t.d." 150 Alloy, and "e.t.d." 180 Alloy steel bars. A revised extra card has been issued, showing the new tolerances and changes in the accuracy extras.

## Ulbrich's New Price List Shows Over-all Downtrend

Ulbrich Stainless Steels Inc., Wallingford, Conn., has effected price adjustments resulting in an over all downward trend. In some instances of special metals, higher production costs and higher initial prices from the mills have caused slightly higher prices. A more realistic price ratio between the common types and the more expensive, less frequently used types has been established.

The new price scale, the result of an intensive study, has been put into an illustrated, 24 page list. The book is divided into four sections: Mill schedule over 25#, Mill schedule less than 25#, Warehouse schedule, and Special Alloys.

## Distributors . . .

**Prices, Page 115**

Some steel service center operators think October business will reach a peak for the year to date. Others are not sure the peak of last spring will be surpassed. Distributors' volume is heavier, with construction steel items moving well, though sales continue spotty.

The pressure of imports continues to hold service center prices down at some points, though imported material is losing some of its influence on the market in the Pacific Northwest.

In general, distributor inventories are well rounded. In some instances, service centers are building stocks of some items.

Steel Warehousing Div., Chicago, Jessop Steel Co., announced it no longer is meeting the price discounts of 7.5 per cent recently prevailing in stainless steel sheets. It has resumed use of the published mill quantity extras in quoting prices.

Anthony J. Kueber, president, explains: "Withdrawal of the discount doesn't mean a basic price increase—it merely returns stainless sheet prices to levels in effect earlier this year. The present discount price structure is endangering the ability of the steel service center to provide customers with adequate inventories and services."

He further stated that the company, trying to restore rationality in pricing to the market, is applying the same policy to operations of Jessop Steel of California, its Los Angeles based service center.

## Plates . . .

**Plate Prices, Page 108**

Demand for sheared and universal carbon plates has softened. But inquiry for alloy plates is holding up well. One producer reports alloy business this month is on a parity with September's—his best period so far this year.

Chemical industry requirements are substantial, and a pickup in cryogenic work is noted. Special steels are being sought for submarines.

Deliveries on alloy plates range four to five weeks on most specifications, but some types require six to seven weeks. Carbon plate shipments range two to four weeks.

## Colored Galvanized Fence Material Now Available

Chain Link fence material is being offered in a wide variety of colors and color combinations for industrial, highway, and residential use by the Colorguard Corp., New York. Known as Colorbond, the product is produced by a process which takes standard galvanized steel wire and permanently surrounds it with a special vinyl compound developed by Union Carbide Plastics Co.

The new fencing is manufactured in the company's Jersey City, N. J., plant, which has a daily capacity of 1 million ft of wire. The vinyl

SILENT HOIST LIFTRUK

MILL-TYPE TRUCK

OPERATES 24 HOURS PER DAY THROUGHOUT THE YEAR

Low Initial Investment

Known affectionately as Big Lug, LIFTRUK is equipped with split-ram or fork tines to give you continuous 24 hour production handling on a plant-wide variety of jobs. Here are a few of the features that put SILENT HOIST LIFTRUK far above "run-of-the-mill" equipment.

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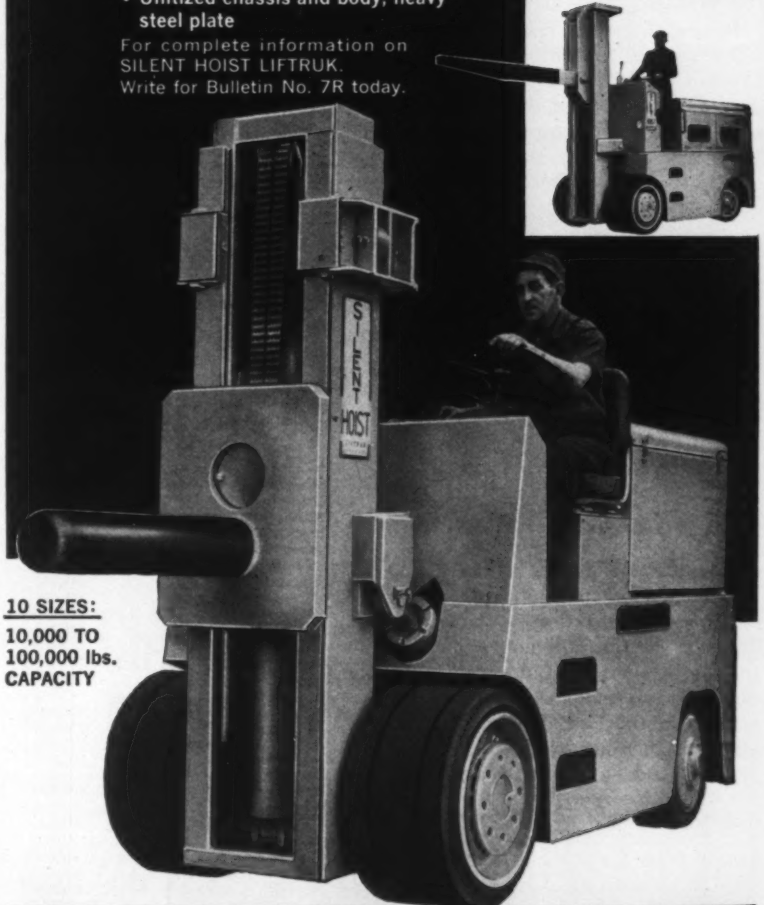

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coating has a tensile strength of 3300 psi, and its elasticity enables it to be stretched 290 per cent of its original length without failure. Pressure of 1855 lb is required to cut through the material.

The vinyl is virtually colorless in its natural state. By the addition of color, fencing can be manufactured in any shade or hue or any combination that's desired. Initially, the fence fabric is being stocked in green, blue, salmon, white, black, and individual colors combined with white.

## Tubular Goods . . .

**Tubular Goods Prices, Page 114**

Buttweld pipe demand is reported holding up well in the Midwest, and expectations are volume this month will equal that in September. Orders have been steadily climbing since early summer. Production is under capacity, but the mills are much busier than they were earlier this year.

Rotary oil drilling operations continue to rise, indicating continued demand for drill pipe. The Hughes Tool Co.'s survey for the last week of record (ended Oct. 9), showed 1848 rigs operating in the U. S., up 18 from the preceding week. Active Canadian rigs totaled 170, an increase of eight.

Demand for cast iron pipe is reported fair; numerous small sales are being made to municipalities. Bids are in for 300 tons for a Seattle water system project and 150 tons for a suburban extension. New bids have been called Nov. 21 for a Camp Lewis Capehart housing project involving 350 tons of cast pipe.

## Pig Iron . . .

**Pig Iron Prices, Page 115**

Demand for merchant pig iron continues spotty, reflecting the labor difficulty in the automotive industry to some extent, but orders are gradually improving at some points, notably in the East. Foundry operations are gaining but they are still buying hand to mouth. A strike at the Columbia, Pa., foundry of the Grinnell Corp. has ended after a suspension of three and a half months.

The movement of merchant iron out of Buffalo via the Great Lakes

## Steel Shipments by Products—August, 1961

(Net tons; all grades, carbon, alloy, and stainless)

| | August, 1961 | | | First Eight Months | |
|---|---|---|---|---|---|
| Products | Carbon | Alloy | Stainless | 1961 | 1960 |
| Ingots | 10,852 | 8,199 | 399 | 143,567 | 255,285 |
| Blooms, etc. | 67,683 | 32,351 | 2,304 | 706,962 | 1,085,639 |
| Tube Rounds | 833 | 251 | ...... | 10,753 | 12,792 |
| Skelp | 2,279 | ...... | ...... | 56,253 | 88,916 |
| Wire Rods | 75,982 | 2,801 | 559 | 577,774 | 668,065 |
| Structurals (heavy) | 388,966 | 5,363 | 5 | 2,809,930 | 3,549,609 |
| Steel Piling | 29,469 | ...... | ...... | 256,306 | 299,258 |
| Plates | 452,479 | 39,602 | 3,313 | 3,641,342 | 4,592,486 |
| Rails (standard) | 29,277 | ...... | ...... | 299,069 | 587,528 |
| Rails (other) | 3,166 | ...... | ...... | 44,323 | 35,071 |
| Joint Bars | 1,569 | ...... | ...... | 12,013 | 22,570 |
| Tie Plates | 3,983 | ...... | ...... | 54,708 | 111,950 |
| Track Spikes | 3,486 | ...... | ...... | 25,405 | 36,951 |
| Wheels | 16,032 | 373 | ...... | 119,465 | 182,915 |
| Axles | 6,029 | ...... | ...... | 38,421 | 84,055 |
| Hot Rolled Bars | 459,405 | 135,782 | 3,345 | 4,006,421 | 5,119,908 |
| Reinforcing Bars | 230,852 | ...... | ...... | 1,636,302 | 1,443,600 |
| Cold Finished Bars | 83,110 | 17,952 | 4,858 | 743,497 | 1,053,136 |
| Tool Steel | 688 | 5,957 | ...... | 50,237 | 63,649 |
| Standard Pipe | 196,909 | 269 | ...... | 1,368,147 | 1,526,829 |
| Oil Country Goods | 125,410 | 29,089 | ...... | 979,753 | 870,208 |
| Line Pipe | 343,245 | 3 | ...... | 1,860,046 | 2,033,113 |
| Mechanical Tubing | 40,042 | 22,267 | 288 | 424,321 | 571,337 |
| Pressure Tubing | 18,351 | 4,171 | 1,441 | 171,418 | 186,978 |
| Drawn Wire | 227,955 | 2,354 | 2,120 | 1,575,545 | 1,719,182 |
| Nails & Staples | 33,300 | ...... | 3 | 232,475 | 232,864 |
| Barbed Wire | 5,165 | ...... | ...... | 53,150 | 34,110 |
| Woven Fence | 8,897 | ...... | ...... | 97,081 | 81,145 |
| Bale Ties, etc. | 7,573 | ...... | ...... | 60,359 | 54,532 |
| Black Plate | 48,175 | ...... | ...... | 357,760 | 431,131 |
| Tin Plate HD | 30,299 | ...... | ...... | 212,201 | 306,896 |
| Tin Plate, electro | 526,276 | ...... | ...... | 3,878,725 | 3,924,544 |
| Sheets HR | 610,562 | 19,945 | 1,931 | 4,394,640 | 5,887,836 |
| Sheets CR | 1,048,742 | 3,917 | 12,642 | 7,468,503 | 10,670,630 |
| Sheets—galvanized | 328,362 | 147 | ...... | 2,129,498 | 2,268,418 |
| Sheets—other | 23,904 | ...... | ...... | 144,630 | 187,631 |
| Elec. Sheets—Strip | 1,617 | 42,611 | ...... | 339,719 | 414,839 |
| Strip HR | 117,955 | 1,849 | 1,018 | 738,663 | 967,980 |
| Strip CR | 102,102 | 2,009 | 16,949 | 768,680 | 970,397 |
| Total (1961) | 5,710,981 | 377,262 | 51,175 | 42,488,062 | ........ |
| Total (1960) | 4,735,020 | 292,644 | 44,289 | ........ | 52,633,983 |

Data from American Iron & Steel Institute.

## Finished Steel Shipments by Markets—August, 1961

(Net tons; all grades)

| | August | August | First Eight Months | |
|---|---|---|---|---|
| Markets | 1961 | 1960 | 1961 | 1960 |
| Processing | 190,097 | 190,966 | 1,523,874 | 2,177,813 |
| Forgings (except auto) | 69,390 | 55,675 | 480,012 | 633,625 |
| Fasteners | 91,749 | 69,192 | 598,170 | 789,724 |
| Warehouses: | | | | |
| Oil & Gas | 150,689 | 77,602 | 986,156 | 812,643 |
| All Other | 987,578 | 766,847 | 6,958,783 | 8,579,793 |
| Total Warehouse | 1,138,267 | 844,449 | 7,944,939 | 9,392,436 |
| Construction: | | | | |
| Oil & Gas | 286,314 | 194,397 | 1,471,707 | 1,636,791 |
| All Other | 686,133 | 559,861 | 4,688,306 | 5,422,834 |
| Total Construction | 972,447 | 754,258 | 6,160,013 | 7,059,625 |
| Contractors' Products | 380,256 | 252,114 | 2,535,769 | 2,686,096 |
| Automotive: | | | | |
| Vehicles, etc. | 1,108,209 | 990,030 | 7,286,532 | 10,121,782 |
| Forgings | 49,323 | 32,382 | 280,323 | 319,067 |
| Total Automotive | 1,157,532 | 1,022,412 | 7,566,855 | 10,440,849 |
| Rail Transportation: | | | | |
| Track, Equipment | 28,566 | 41,407 | 318,387 | 644,238 |
| Cars, Locomotives | 99,748 | 87,973 | 656,536 | 1,389,009 |
| Transit Systems | 4,348 | 1,696 | 20,889 | 24,869 |
| Total Railroad | 132,662 | 131,076 | 995,812 | 2,058,116 |
| Shipbuilding | 51,939 | 44,068 | 398,950 | 424,779 |
| Aircraft | 7,018 | 6,427 | 48,331 | 56,810 |
| Oil, Gas Drilling | 31,020 | 27,806 | 237,584 | 319,424 |
| Mining, Quarrying | 25,048 | 22,335 | 178,541 | 205,703 |
| Agricultural: | | | | |
| Machinery | 55,274 | 44,054 | 452,798 | 545,840 |
| All Other | 32,929 | 14,904 | 233,103 | 173,859 |
| Total Agricultural | 88,203 | 58,958 | 685,901 | 719,699 |
| Machinery | 315,639 | 246,704 | 2,371,191 | 3,001,135 |
| Elec. Machinery | 175,650 | 146,500 | 1,272,372 | 1,478,295 |
| Appliances | 147,102 | 97,402 | 1,099,413 | 1,328,631 |
| Other Equipment | 174,845 | 139,051 | 1,151,633 | 1,437,591 |
| Containers: | | | | |
| Cans & Closures | 523,753 | 463,748 | 3,919,947 | 3,909,367 |
| Barrels, Drums | 69,626 | 58,255 | 515,600 | 615,131 |
| All Other | 59,901 | 45,482 | 315,469 | 465,026 |
| Total Containers | 653,280 | 567,485 | 4,751,016 | 4,989,524 |
| Ordnance | 16,902 | 15,592 | 97,617 | 110,046 |
| Exports | 135,734 | 204,827 | 1,017,646 | 1,867,112 |
| Nonclassified | 184,638 | 174,656 | 1,372,423 | 1,456,950 |
| Total shipments | 6,139,418 | 5,071,953 | 42,488,062 | 52,633,983 |

Data from American Iron & Steel Institute.

is accelerating as the lakes navigation season is nearing the end. Vessels are expected to take iron to Midwestern points as long as weather permits. The export movement of iron out of Buffalo has tapered off from the summer peak, but additional shipments are scheduled before the St. Lawrence Seaway closes.

Stockholders of the Woodward Iron Co., Woodward, Ala., have approved proposals for the acquisition of the Lynchburg Foundry Co. and the National Cement Co.

## General Electric Raises Price on Transformers

A price increase of 6 per cent on all transformers 501 kva and above was announced by the Medium Transformer and Power Transformer Departments of General Electric Co., Schenectady, N. Y. Last year, the company drastically reduced its transformer prices.

## Issues New Stock List

Bralco Metals Inc., Los Angeles, has issued a new stock list of aluminum and copper base alloys for Southern California buyers. It's designed as a quick, simplified reference to the company's stock of aluminum, brass, bronze, copper, and nickel silver in a wide range of alloys and tempers.

## September Steel Output Up Sharply from Year Ago

Production of ingots and steel for castings in September totaled 8,904,000 net tons, up 2.8 per cent from August's 8,660,527 tons and 38 per cent from the 6,458,421 tons produced in September, 1960, reports the American Iron & Steel Institute.

The month's total brought output for the third quarter to 25,656,485 tons vs. 25,117,169 in the second quarter, 19,741,491 in the first quarter, and 19,647,345 tons in the third quarter of last year. The nine-month 1961 total of 70,515,145 tons was down 12.3 per cent from the 80,401,440 tons poured in the like period of 1960.

During September, the index of steel production (based on average output of the three years 1957-59 as 100) increased to 111.5, the highest level for any month since April, 1960 when the index stood at 122.5. The index stood at 105 in August and 80.9 in September a year ago.

For the third quarter of this year the index was 104.8 vs. 103.7 in the second quarter and 80.2 in the third quarter last year. The index for

## Steel Ingot Production September, 1961

| Period | Open Hearth (Net tons) | Bessemer (Net tons) | Basic Oxygen Process (Net tons) | Electric (b) (Net tons) | Totals (Net tons) | Index (a) |
|---|---|---|---|---|---|---|
| 1961 | | | | | | |
| January ..... | 5,539,900 | 49,609 | 213,255 | 613,240 | 6,416,004 | 77.8 |
| February .... | 5,347,458 | 68,138 | 225,963 | 597,539 | 6,239,098 | 83.7 |
| March ...... | 6,068,244 | 75,694 | 281,698 | 660,753 | 7,086,389 | 85.9 |
| 1st Quarter ... | 16,955,602 | 193,441 | 720,916 | 1,871,532 | 19,741,491 | 82.4 |
| April ........ | 6,551,518 | 65,503 | 269,991 | 697,675 | 7,584,687 | 95.0 |
| May ........ | 7,743,927 | 79,758 | 342,251 | 814,690 | 8,980,626 | 108.9 |
| June ........ | 7,375,876 | 85,494 | 323,589 | 766,897 | 8,551,856 | 107.1 |
| 2nd Quarter ... | 21,671,321 | 230,755 | 935,831 | 2,279,262 | 25,117,169 | 103.7 |
| 1st Half ....... | 38,626,923 | 424,196 | 1,656,747 | 4,150,794 | 44,858,660 | 93.1 |
| July ........ | 7,131,419 | 78,585 | 254,245 | 627,709 | 8,091,958 | 98.1 |
| *August ...... | 7,511,016 | 81,554 | 297,406 | 770,551 | 8,660,527 | 105.0 |
| †September ... | 7,692,000 | 86,000 | 377,000 | 749,000 | 8,904,000 | 111.5 |
| †3rd Quarter ... | 22,334,435 | 246,139 | 928,651 | 2,147,260 | 25,656,485 | 104.8 |
| †9 Months ...... | 60,961,358 | 670,335 | 2,585,398 | 6,298,054 | 70,515,145 | 97.1 |
| 1960 | | | | | | |
| January ..... | 10,510,616 | 211,132 | 280,981 | 1,046,675 | 12,049,404 | 146.1 |
| February .... | 9,715,527 | 216,263 | 245,458 | 949,558 | 11,126,806 | 144.2 |
| March ....... | 10,103,122 | 202,812 | 306,741 | 952,008 | 11,564,683 | 140.2 |
| 1st Quarter .... | 30,329,265 | 630,207 | 833,180 | 2,948,241 | 34,740,893 | 143.4 |
| April ........ | 8,603,306 | 105,336 | 302,763 | 766,452 | 9,777,857 | 122.5 |
| May ........ | 7,844,140 | 73,010 | 309,505 | 603,817 | 8,830,472 | 107.0 |
| June ........ | 6,441,594 | 80,344 | 314,766 | 568,169 | 7,404,873 | 92.7 |
| 2nd Quarter ... | 22,889,040 | 258,690 | 927,034 | 1,938,438 | 26,013,202 | 107.4 |
| 1st Half ....... | 53,218,305 | 888,897 | 1,760,214 | 4,886,679 | 60,754,095 | 125.4 |
| July ......... | 5,494,331 | 61,700 | 289,003 | 505,890 | 6,350,924 | 77.0 |
| August ...... | 5,860,394 | 52,652 | 279,550 | 645,404 | 6,838,000 | 82.9 |
| September ... | 5,525,244 | 42,228 | 287,323 | 603,626 | 6,458,421 | 80.9 |
| 3rd Quarter ... | 16,879,969 | 156,580 | 855,876 | 1,754,920 | 19,647,345 | 80.2 |
| 9 Months ...... | 70,098,274 | 1,045,477 | 2,616,090 | 6,641,599 | 80,401,440 | 110.3 |
| October ..... | 5,917,780 | 56,914 | 270,450 | 623,236 | 6,868,380 | 83.3 |
| November ... | 5,308,894 | 51,246 | 257,286 | 554,514 | 6,171,940 | 77.3 |
| December .... | 5,042,558 | 35,559 | 202,330 | 559,394 | 5,839,841 | 70.8 |
| 4th Quarter ... | 16,269,232 | 143,719 | 730,066 | 1,737,144 | 18,880,161 | 77.1 |
| 2nd Half ...... | 33,149,201 | 300,299 | 1,585,942 | 3,492,064 | 38,527,506 | 78.7 |
| Totals (1960) .. | 86,367,506 | 1,189,196 | 3,346,156 | 8,378,743 | 99,281,601 | 101.9 |

*Revised. †Preliminary. (a) Index based on average production 1957-59 as 100. (b) Includes crucible steel. Data from American Iron & Steel Institute.

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the first nine months this year was 97.1 vs. 110.3 in the comparable period of 1960.

## Reinforcing Bars . . .

**Reinforcing Bar Prices, Page 109**

Strong demand for reinforcing bars continues. Heavy tonnage is being shipped from the mills, though new orders have declined seasonally. New construction projects are less in evidence. October and November are expected to be good shipping months, with mills producing at a fast pace.

In New England, reinforcing bars in place for bridge structures range from 10.50 cents to 12.00 cents per pound. Fabricated deformed bars are moving under 8 cents, and some tonnage is going nearer 7 cents per pound despite efforts to firm up the market.

Order backlogs vary widely among fabricators and distributors. Pending jobs include 7500 tons of bars for a freeway in Seattle.

## Wire . . .

**Wire Prices, Pages 110 & 113**

Demand for manufacturers' wire is fairly strong. Order books of some makers are reported fairly full, and they are expecting October volume will equal that of September.

Merchant wire is moving sluggishly. The movement is expected to slow down steadily as the fall and winter season advances. Shipments are prompt.

# Steel Ingot Rate Slips Further

SLOWING down of steel production continues. Ingot output in the latest week of record (ended Oct. 14) was 2,071,000 net tons compared with 2,102,000 tons in the preceding week.

STEEL's estimates output in the week ended Oct. 21 will register another slight drop to 2,050,000 tons, but indications are production will level out, possibly rise, in following weeks, especially if automotive labor trouble has been eliminated.

Production in the latest week of record was off in five districts, up in four, and unchanged in three, reports the American Iron & Steel Institute.

- **Chicago**—Steelmaking is scheduled at 72 per cent of 1960 capacity, down 2 points from the previous week. For several weeks, operations have reflected an increase in semifinished inventories. With those needs filled, the ingot rate is being more closely geared to finished product shipping schedules.

- **Pittsburgh**—Production held last week at 73 per cent of 1960 capacity. Output in the preceding week was 431,800 ingot tons, about 8000 less than was produced the week before.

- **Detroit** — Ingot production has moved up again as Ford's steel plant resumed operation. Other district mills continue to operate close to capacity, and the steelmaking index is expected to climb to 135.

- **Philadelphia**—District steel production is holding steady, following the recent steady advance.

- **Cincinnati**—Area ingot production is heading toward the year's highest level. Production is forecast at 96,415 tons for the latest week, equal to 84 per cent of capacity.

- **Los Angeles**—Slackening demand has pushed the Western District operating rate down slightly from the preceding week's when 139,126 tons were produced.

- **Youngstown**—The district ingot rate fell 2 points in the latest week of record, and operations are estimated to be around 64 per cent of 1960 capacity.

- **Birmingham** — The steelmaking rate in this district is estimated at 73.5 per cent of 1960 rated capacity.

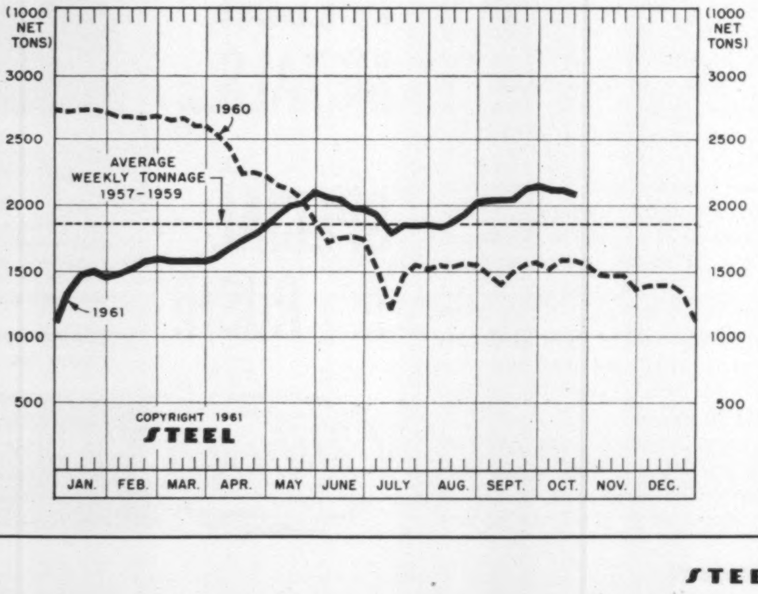
- **Cleveland** — The district's steel producton index fell sharply in the latest week of record to 127 from 143 the preceding week. Producers have lowered production schedules because demand has failed to develop as expected—partly due to automotive labor trouble.

## STEEL INGOT PRODUCTION

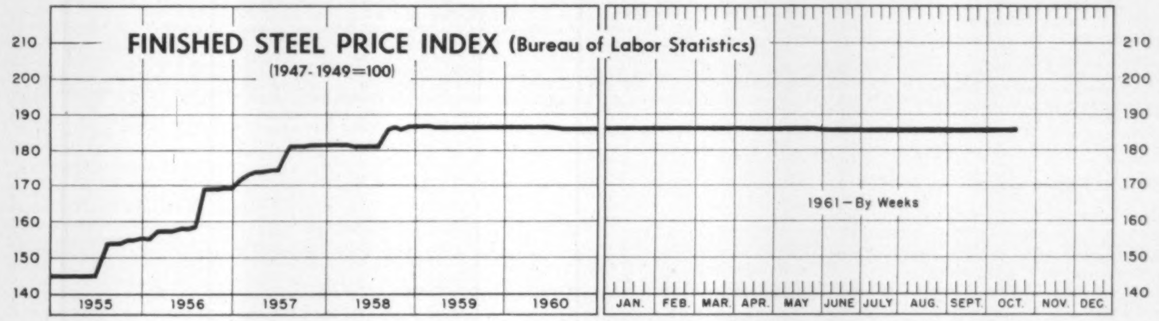
| Weeks Ended | Net Tons | Change |
|---|---|---|
| Oct. 21 | 2,050,000* | — 1.0% |
| Oct. 14 | 2,071,000 | — 1.5% |
| Oct. 7 | 2,102,000 | — 1.4% |
| **Totals to Oct. 14** | | |
| 1961 | 74,622,000 | —10.0% |
| 1960 | 82,902,000 | |

| DISTRICTS | Week Ended Oct. 14 Tons‡ | Week Ended Oct. 14 Index† | Week Ended Oct. 7 Index† |
|---|---|---|---|
| Northeastern | 299,264 | 112 | 108 |
| Buffalo | 101,249 | 104 | 104 |
| Pittsburgh | 431,852 | 107 | 109 |
| Youngstown | 173,400 | 102 | 101 |
| Cleveland | 117,602 | 127 | 143 |
| Detroit | 115,390 | 110 | 123 |
| Chicago | 415,251 | 111 | 114 |
| Cincinnati | 95,858 | 127 | 124 |
| St. Louis | 62,535 | 119 | 119 |
| Southern | 118,156 | 109 | 106 |
| Western | 139,126 | 119 | 119 |
| Industry | 2,071,000 | 11.2 | 112.8 |

*Estimated by STEEL.
†1957-59 (1,862,933 tons) = 100.
‡District tonnages are approximate and will not necessarily add to the national total.



# Price Indexes and Composites



| Oct. 17, 1961 | Week Ago | Month Ago | Sept. Index | Year Ago |
|---|---|---|---|---|
| **185.4** | **185.4** | **185.4** | **185.4** | **186.2** |

## AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

**Week Ended Oct. 17**

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deduction applicable to them, write to STEEL.

| | |
|---|---|
| Rails, Standard No. 1 | $5.825 |
| Rails, Light, 40 lb | 7.292 |
| Tie Plates | 6.875 |
| Axles, Railway | 10.175 |
| Wheels, Freight Car, 33 in. (per wheel) | 62.000 |
| Plates, Carbon | 6.350 |
| Structural Shapes | 6.167 |
| Bars, Tool Steel, Carbon (lb) | 0.560 |
| Bars, Tool Steel, Alloy, Oil Hardening Die (lb) | 0.680 |
| Bars, Tool Steel, H.R. Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.060 (lb) | 1.400 |
| Bars, Tool Steel, H.R. Alloy, High Speed, W18, Cr 4, V 1 (lb) | 1.895 |
| Bars, H.R., Alloy | 10.775 |
| Bars, H.R., Stainless, 303 (lb) | 0.543 |
| Bars, H.R., Carbon | 6.675 |
| Bars, Reinforcing | (N.A.) |
| Bars, C.F., Carbon | 10.710 |
| Bars, C.F., Alloy | 14.125 |
| Bars, C.F., Stainless, 302 (lb) | 0.570 |
| Sheets, H.R., Carbon | 6.350 |
| Sheets, C.R., Carbon | 7.300 |
| Sheets, Galvanized | 8.775 |
| Sheets, C.R., Stainless, 302 (lb) | 0.643 |
| Sheets, Electrical | 12.625 |
| Strip, C.R., Carbon | 9.225 |
| Strip, C.R., Stainless, 430 (lb) | 0.460 |
| Strip, H.R., Carbon | 6.250 |
| Pipe, Black, Buttweld (100 ft) | 19.495 |
| Pipe, Galv., Buttweld (100 ft) | 23.098 |
| Pipe Line (100 ft) | 195.423 |
| Casing, Oil Well, Carbon (100 ft) | 193.028 |
| Casing, Oil Well, Alloy (100 ft) | 302.645 |
| Tubes, Boiler (100 ft) | 51.200 |
| Tubing, Mechanical, Carbon (100 ft) | 27.005 |
| Tubing, Mechanical, Stainless, 304 (100 ft) | 192.285 |
| Tin Plate, Hot-dipped, 1.25 lb (95 lb base box) | 10.100 |
| Tin Plate, Electrolytic, 0.25 lb (95 lb base box) | 8.800 |
| Black Plate, Canmaking Quality (95 lb base box) | 7.900 |
| Wire, Drawn, Carbon | 10.575 |
| Wire, Drawn, Stainless, 430 (lb) | 0.665 |
| Bale Ties (Bundles) | 7.647 |
| Nails, 8d Common (50 lb) | 4.715 |
| Wire, Barbed (80-rod spool) | 8.372 |
| Woven Wire Fence (20-rod roll) | 20.910 |

## STEEL's FINISHED STEEL PRICE INDEX

| | Oct. 18 1961 | Week Ago | Month Ago | Year Ago | 5 Yr Ago |
|---|---|---|---|---|---|
| Index (1935-39 avg = 100) | 247.82 | 247.82 | 247.82 | 247.82 | 225.58 |
| Index in cents per lb | 6.713 | 6.713 | 6.713 | 6.713 | 6.111 |

## STEEL's ARITHMETICAL PRICE COMPOSITES

| | | | | | |
|---|---|---|---|---|---|
| Finished Steel, NT | $149.96 | $149.96 | $149.96 | $149.96 | $137.48 |
| No. 2 Fdry, Pig Iron, GT | 66.49 | 66.49 | 66.49 | 66.49 | 62.63 |
| Basic Pig Iron, GT | 65.99 | 65.99 | 65.99 | 65.99 | 62.18 |
| Malleable Pig Iron, GT | 67.27 | 67.27 | 67.27 | 67.27 | 63.41 |
| Steelmaking Scrap, GT | 38.83 | 39.17 | 39.83 | 30.17 | 56.67 |

# Comparison of Prices

Comparative prices by districts in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

| FINISHED STEEL | Oct. 18 1961 | Week Ago | Month Ago | Year Ago | 5 Yr Ago |
|---|---|---|---|---|---|
| Bars, H.R., Pittsburgh | 5.675 | 5.675 | 5.675 | 5.675 | 5.075 |
| Bars, H.R., Chicago | 5.675 | 5.675 | 5.675 | 5.675 | 5.075 |
| Bars, H.R., deld., Philadelphia | 5.98 | 5.98 | 5.98 | 5.975 | 4.93 |
| Bars, C.R., Pittsburgh | 7.65 | 7.65 | 7.65 | 7.65 | 6.85 |
| Shapes, Std., Pittsburgh | 5.50 | 5.50 | 5.50 | 5.50 | 5.00 |
| Shapes, Std., Chicago | 5.50 | 5.50 | 5.50 | 5.50 | 5.00 |
| Shapes, deld., Philadelphia | 5.745 | 5.745 | 5.745 | 5.77 | 5.00 |
| Plates, Pittsburgh | 5.30 | 5.30 | 5.30 | 5.30 | 4.85 |
| Plates, Chicago | 5.30 | 5.30 | 5.30 | 5.30 | 4.85 |
| Plates, Coatesville, Pa. | 5.30 | 5.30 | 5.30 | 5.30 | 5.25 |
| Plates, Sparrows Point, Md. | 5.30 | 5.30 | 5.30 | 5.30 | 4.85 |
| Plates, Claymont, Del. | 5.30 | 5.30 | 5.30 | 5.30 | 5.35 |
| Sheets, H.R., Pittsburgh | 5.10 | 5.10 | 5.10 | 5.10 | 4.675 |
| Sheets, H.R., Chicago | 5.10 | 5.10 | 5.10 | 5.10 | 4.675 |
| Sheets, C.R., Pittsburgh | 6.275 | 6.275 | 6.275 | 6.275 | 5.75 |
| Sheets, C.R., Chicago | 6.275 | 6.275 | 6.275 | 6.275 | 5.75 |
| Sheets, C.R., Detroit | 6.275 | 6.275 | 6.275 | 6.275 | 5.75-5.85 |
| Sheets, Galv., Pittsburgh | 6.875 | 6.875 | 6.875 | 6.875 | 6.30 |
| Strip, H.R., Pittsburgh | 5.10 | 5.10 | 5.10 | 5.10 | 4.675 |
| Strip, H.R., Chicago | 5.10 | 5.10 | 5.10 | 5.10 | 4.675 |
| Strip, C.R., Pittsburgh | 7.425 | 7.425 | 7.425 | 7.425 | 6.85 |
| Strip, C.R., Chicago | 7.425 | 7.425 | 7.425 | 7.425 | 6.85 |
| Strip, C.R., Detroit | 7.425 | 7.425 | 7.425 | 7.425 | 6.95 |
| Wire, Basic, Pittsburgh | 8.00 | 8.00 | 8.00 | 8.00 | 7.20 |
| Nails, Wire, nonstock, Pitts. | 8.95 | 8.95 | 8.95 | 8.95 | 8.20 |
| Tin Plate (1.50 lb)box, Pitts. | $10.65 | $10.65 | $10.65 | $10.65 | $9.85 |

## SEMIFINISHED STEEL

| | | | | | |
|---|---|---|---|---|---|
| Billets, forging, Pitts. (NT) | $99.50 | $99.50 | $99.50 | $99.50 | $91.50 |
| Wire rods, $\frac{7}{32}$-$\frac{5}{8}$" Pitts. | 6.40 | 6.40 | 6.40 | 6.40 | 5.80 |

| PIG IRON, Gross Ton | Oct. 18 1961 | Week Ago | Month Ago | Year Ago | 5 Yr Ago |
|---|---|---|---|---|---|
| Bessemer, Pittsburgh | $67.00 | $67.00 | $67.00 | $67.00 | $63.50 |
| Basic, Valley | 66.00 | 66.00 | 66.00 | 66.00 | 62.50 |
| Basic, deld., Philadelphia | 70.18 | 70.18 | 70.18 | 70.07 | 66.26 |
| No. 2 Fdry, NevilleIsland, Pa. | 66.50 | 66.50 | 66.50 | 66.50 | 63.00 |
| No. 2 Fdry, Chicago | 66.50 | 66.50 | 66.50 | 66.50 | 63.00 |
| No. 2 Fdry, deld., Phila. | 70.68 | 70.68 | 70.68 | 70.57 | 66.76 |
| No. 2 Fdry, Birmingham | 62.50 | 62.50 | 62.50 | 62.50 | 59.00 |
| No. 2 Fdry(Birm.), deld., Cin. | 70.20 | 70.20 | 70.20 | 70.20 | 66.70 |
| Malleable, Valley | 66.50 | 66.50 | 66.50 | 66.50 | 63.00 |
| Malleable, Chicago | 66.50 | 66.50 | 66.50 | 66.50 | 63.00 |
| Ferromanganese, net ton† | 245.00 | 245.00 | 245.00 | 245.00 | 235.00 |

---

†74-76% Mn, Duquesne, Pa.

## SCRAP, Gross Ton (Including broker's commission)

| | | | | | |
|---|---|---|---|---|---|
| No. 1 Heavy Melt, Pittsburgh | $37.50 | $37.50 | $37.50 | $28.50 | $55.50 |
| No. 1 Heavy Melt, E. Pa. | 40.50 | 40.50 | 40.50 | 34.00 | 56.50 |
| No. 1 Heavy Melt, Chicago | 38.50 | 39.50 | 41.50 | 28.00 | 58.00 |
| No. 1 Heavy Melt, Valley | 39.50 | 39.50 | 42.50 | 27.50 | 63.50 |
| No. 1 Heavy Melt, Cleve. | 36.50 | 36.50 | 38.50 | 25.50 | 61.50 |
| No. 1 Heavy Melt, Buffalo | 32.50 | 32.50 | 32.50 | 27.50 | 57.50 |
| Rails, Rerolling, Chicago | 59.50 | 60.50 | 61.50 | 48.00 | 84.00 |
| No. 1 Cast, Chicago | 42.50 | 42.50 | 44.50 | 36.50 | 50.50 |

## COKE, Net Ton

| | | | | | |
|---|---|---|---|---|---|
| Beehive, Furn., Connlsvl. | $15.00 | $15.00 | $15.00 | $15.00 | $14.50 |
| Beehive, Fdry., Connlsvl. | 18.25 | 18.25 | 18.25 | 18.25 | 17.50 |
| Oven, Fdry., Milwaukee | 32.00 | 32.00 | 32.00 | 32.00 | 29.50 |

# Steel Prices

Mill base prices reported to STEEL, Oct. 18, cents per pound except as otherwise noted. *Changes shown in italics.* Code number following mill point indicates producing company. Key to producers, page 109; footnotes, page 113.

## SEMIFINISHED

### INGOTS, Carbon Forging (NT)

| | |
|---|---|
| Munhall,Pa. U5 | $76.00 |

### INGOT, Alloy (NT)

| | |
|---|---|
| Detroit S41 | $82.00 |
| Economy,Pa. B14 | 82.00 |
| Farrell,Pa.. S3 | 82.00 |
| Lowellville,O. S3 | 82.00 |
| Midland,Pa. C18 | 82.00 |
| Munhall,Pa. U5 | 82.00 |
| Sharon,Pa. S3 | 82.00 |

### BILLETS, BLOOMS & SLABS Carbon Rolling (NT)

| | |
|---|---|
| Bartonville,Ill. K4 | $82.00 |
| Bessemer,Pa. U5 | 80.00 |
| Buffalo R2 | 80.00 |
| Clairton,Pa. U5 | 80.00 |
| Ensley,Ala. T2 | 80.00 |
| Fairfield,Ala. T2 | 80.00 |
| Fontana,Calif. K1 | 90.50 |
| Gary,Ind. U5 | 80.00 |
| Johnstown,Pa. B2 | 80.00 |
| Lackawanna,N.Y. B2 | 80.00 |
| Munhall,Pa. U5 | 80.00 |
| Owensboro,Ky. G8 | 80.00 |
| S.Chicago,Ill. R2, U5 | 80.00 |
| S.Duquesne,Pa. U5 | 80.00 |
| Sterling,Ill. N15 | 80.00 |
| Youngstown R2 | 80.00 |

### Carbon, Forging (NT)

| | |
|---|---|
| Bessemer,Pa. U5 | $99.50 |
| Buffalo R2 | 99.50 |
| Canton,O. R2 | 102.00 |
| Clairton,Pa. U5 | 99.50 |
| Conshohocken,Pa. A3 | 99.50 |
| Ensley,Ala. T2 | 99.50 |
| Fairfield,Ala. T2 | 99.50 |
| Farrell,Pa. S3 | 99.50 |
| Fontana,Calif. K1 | 109.00 |
| Gary,Ind. U5 | 99.50 |
| Geneva,Utah C11 | 99.50 |
| Houston S5 | 104.50 |
| Johnstown,Pa. B2 | 99.50 |
| Lackawanna,N.Y. B2 | 99.50 |
| LosAngeles B3 | 109.00 |
| Midland,Pa. C18 | 99.50 |
| Munhall,Pa. U5 | 99.50 |
| Owensboro,Ky. C8 | 99.50 |
| Seattle B3 | 109.00 |
| Sharon,Pa. S3 | 99.50 |
| S.Chicago R2, U5, W14 | 99.50 |
| S.Duquesne,Pa. U5 | 99.50 |
| S.SanFrancisco B3 | 109.00 |
| Warren,O. C17 | 99.50 |

### Alloy, Forging (NT)

| | |
|---|---|
| Bethlehem,Pa. B2 | $119.00 |
| Bridgeport,Conn. C32 | 119.00 |
| Buffalo R2 | 119.00 |
| Canton,O. R2,T7 | 119.00 |
| Conshohocken,Pa. A3 | 121.00 |
| Detroit S41 | 119.00 |
| Economy,Pa. B14 | 119.00 |
| Farrell,Pa. S3 | 119.00 |
| Fontana,Calif. K1 | 140.00 |
| Gary,Ind. U5 | 119.00 |
| Houston S5 | 124.00 |
| Ind.Harbor,Ind. Y1 | 119.00 |
| Johnstown,Pa. B2 | 119.00 |
| Lackawanna,N.Y. B2 | 119.00 |
| LosAngeles B3 | 139.00 |
| Lowellville,O. S3 | 119.00 |
| Massillon,O. R2 | 119.00 |
| Midland,Pa. C18 | 119.00 |
| Munhall,Pa. U5 | 119.00 |
| Owensboro,Ky. G8 | 119.00 |
| Seattle(6) B3 | 140.00 |
| Sharon,Pa. S3 | 119.00 |
| S.Chicago R2,U5,W14 | 119.00 |
| S.Duquesne,Pa. U5 | 119.00 |
| Struthers,O. Y1 | 119.00 |
| Warren,O. C17 | 119.00 |

### ROUNDS, SEAMLESS TUBE (NT)

| | |
|---|---|
| Buffalo R2 | $122.50 |
| Canton,O. R2 | 125.00 |
| Cleveland R2 | 122.50 |
| Gary,Ind. U5 | 122.50 |
| S.Chicago,Ill. R2,W14 | 122.50 |
| S.Duquesne,Pa. U5 | 122.50 |
| Warren,O. C17 | 122.50 |

### SKELP

| | |
|---|---|
| Aliquippa,Pa. J5 | 5.05 |
| Benwood,W.Va. W10 | 5.05 |
| Ind.Harbor,Ind. Y1 | 5.05 |
| Munhall,Pa. P5 | 5.05 |
| Pittsburgh J5 | 5.05 |
| Warren,O. R2 | 5.05 |
| Youngstown R2, U5 | 5.05 |

### WIRE RODS

| | |
|---|---|
| AlabamaCity,Ala. R2 | 6.40 |
| Aliquippa,Pa. J5 | 6.40 |
| Alton,Ill. L1 | 6.60 |
| Bartonville,Ill. K4 | 6.50 |
| Buffalo W12 | 6.40 |
| Cleveland A7 | 6.40 |
| Donora,Pa. A7 | 6.40 |
| Fairfield,Ala. T2 | 6.40 |
| Houston S5 | 6.65 |
| IndianaHarbor,Ind. Y1 | 6.40 |
| Johnstown,Pa. B2 | 6.40 |
| Joliet,Ill. A7 | 6.40 |
| KansasCity,Mo. S5 | 6.65 |
| Kokomo,Ind. C16 | 6.50 |
| LosAngeles B3 | 7.20 |
| Minnequa,Colo. C10 | 6.65 |
| Monessen,Pa. P7 | 6.40 |
| N.Tonawanda S47 | 6.40 |
| Pittsburg,Calif. C11 | 7.20 |
| Portsmouth,O. P12 | 6.40 |
| Roebling,N..J. R5 | 6.50 |
| S.Chicago,Ill. R2, W14 | 6.40 |
| SparrowsPoint,Md. B2 | 6.50 |
| Sterling,Ill.(1) N15 | 6.40 |
| Sterling,Ill. N15 | 6.50 |
| Struthers,O. Y1 | 6.40 |
| Worcester,Mass. A7 | 6.70 |

## STRUCTURALS

### Carbon Steel Std. Shapes

| | |
|---|---|
| AlabamaCity,Ala. R2 | 5.50 |
| Aliquippa,Pa. J5 | 5.50 |
| Atlanta A11 | 5.70 |
| Bessemer,Ala. T2 | 5.50 |
| Bethlehem,Pa. B2 | 5.55 |
| Birmingham C15 | 5.50 |
| Clairton,Pa. U5 | 5.50 |
| Fairfield,Ala. T2 | 5.50 |
| Fontana,Calif. K1 | 6.30 |
| Gary,Ind. U5 | 5.50 |
| Geneva,Utah C11 | 5.50 |
| Houston S5 | 5.60 |
| Ind.Harbor,Ind. I-2, Y1 | 5.50 |
| Johnstown,Pa. B2 | 5.55 |
| Joliet,Ill. P22 | 5.50 |
| KansasCity,Mo. S5 | 5.60 |
| Lackawanna,N.Y. B2 | 5.55 |
| LosAngeles B3 | 6.20 |
| Minnequa,Colo. C10 | 5.80 |
| Munhall,Pa. U5 | 5.50 |
| Niles,Calif. P1 | 6.25 |
| Phoenixville,Pa. P4 | 5.55 |
| Portland,Oreg. O4 | 6.25 |
| Seattle B3 | 6.25 |
| S.Chicago,Ill. U5, W14 | 5.50 |
| S.SanFrancisco B3 | 6.15 |
| Sterling,Ill. N15 | 5.50 |
| Struthers,O. Y1 | 5.50 |
| Torrance,Calif. C11 | 6.20 |
| Weirton,W.Va. W6 | 5.50 |

### Wide Flange

| | |
|---|---|
| Bethlehem,Pa. B2 | 5.55 |
| Clairton,Pa. U5 | 5.50 |
| Fontana,Calif. K1 | 6.45 |
| IndianaHarbor,Ind. I-2 | 5.50 |
| Lackawanna,N.Y. B2 | 5.55 |
| Munhall,Pa. U5 | 5.50 |
| Phoenixville,Pa. P4 | 5.55 |
| S.Chicago,Ill. U5 | 5.50 |
| Sterling,Ill. N5 | 5.50 |
| Weirton,W.Va. W6 | 5.50 |

### Alloy Std. Shapes

| | |
|---|---|
| Aliquippa,Pa. J5 | 6.80 |
| Clairton,Pa. U5 | 6.80 |
| Gary,Ind. U5 | 6.80 |
| Houston S5 | 6.90 |
| Munhall,Pa. U5 | 6.80 |
| S.Chicago,Ill. U5, W14 | 6.80 |

### H.S., L.A., Std. Shapes

| | |
|---|---|
| Aliquippa,Pa. J5 | 8.05 |
| Bessemer,Ala. T2 | 8.05 |
| Bethlehem,Pa. B2 | 8.10 |
| Clairton,Pa. U5 | 8.05 |
| Fairfield,Ala. T2 | 8.05 |
| Fontana,Calif. K1 | 8.85 |
| Gary,Ind. U5 | 8.05 |
| Geneva,Utah C11 | 8.05 |
| Houston S5 | 8.15 |
| Ind.Harbor,Ind. I-2, Y1 | 8.05 |
| Johnstown,Pa. B2 | 8.10 |
| KansasCity,Mo. S5 | 8.15 |
| LackawannaN.Y. B2 | 8.10 |
| LosAngeles B3 | 8.75 |
| Munhall,Pa. U5 | 8.05 |
| Phoenixville,Pa. P4 | 8.10 |
| Seattle B3 | 8.80 |
| S.Chicago,Ill. U5, W14 | 8.05 |
| S.SanFrancisco B3 | 8.70 |
| Sterling,Ill. N15 | 7.75 |
| Struthers,O. Y1 | 8.05 |

### H.S., L.A., Wide Flange

| | |
|---|---|
| Bethlehem,Pa. B2 | 8.10 |
| Ind.Harbor,Ind. I-2 | 8.05 |
| Lackawanna,N.Y. B2 | 8.10 |
| Munhall,Pa. U5 | 8.05 |
| S.Chicago,Ill. U5 | 8.05 |
| Sterling,Ill. N15 | 7.75 |

## PILING

### BEARING PILES

| | |
|---|---|
| Bethlehem,Pa. B2 | 5.55 |
| Ind.Harbor,Ind. I-2 | 5.50 |
| Lackawanna,N.Y. B2 | 5.55 |
| Munhall,Pa. U5 | 5.50 |
| S.Chicago,Ill. I-2, U5 | 5.50 |

### STEEL SHEET PILING

| | |
|---|---|
| Ind.Harbor,Ind. I-2 | 6.50 |
| Lackawanna,N.Y. B2 | 6.50 |
| Munhall,Pa. U5 | 6.50 |
| S.Chicago,Ill. I-2, U5 | 6.50 |
| Weirton,W.Va. W6 | 6.50 |

## PLATES

### PLATES, Carbon Steel

| | |
|---|---|
| AlabamaCity,Ala. R2 | 5.30 |
| Aliquippa,Pa. J5 | 5.30 |
| Ashland,Ky(15) A10 | 5.30 |
| Bessemer,Ala. T2 | 5.30 |
| Clairton,Pa. U5 | 5.30 |
| Claymont,Del. P4 | 5.30 |
| Cleveland J5, R2 | 5.30 |
| Coatesville,Pa. L7 | 5.30 |
| Conshohocken,Pa. A3 | 5.30 |
| Ecorce,Mich. G5 | 5.30 |
| Fairfield,Ala. T2 | 5.30 |
| Farrell,Pa. S3 | 5.30 |
| Fontana,Calif.(30) K1 | 6.10 |
| Gary,Ind. U5 | 5.30 |
| Geneva,Utah C11 | 5.30 |
| GraniteCity,Ill. G4 | 5.40 |
| Houston S5 | 5.40 |
| Ind.Harbor,Ind. I-2, Y1 | 5.30 |
| Johnstown,Pa. B2 | 5.30 |
| Lackawanna,N.Y. B2 | 5.30 |
| Mansfield,O. E6 | 5.30 |
| Minnequa,Colo. C10 | 6.15 |
| Munhall,Pa. U5 | 5.30 |
| Newport,Ky. A2 | 5.30 |
| Pittsburgh J5 | 5.30 |
| Riverdale,Ill. A1 | 5.30 |
| Seattle B2 | 6.20 |
| Sharon,Pa. S3 | 5.30 |
| S.Chicago,Ill. U5, W14 | 5.30 |
| SparrowsPoint,Md. B2 | 5.30 |
| Sterling,Ill. N15 | 5.30 |
| Steubenville,O. W10 | 5.30 |
| Warren,O. R2 | 5.30 |
| Youngstown U5, Y1 | 5.30 |
| Youngstown(27) R2 | 5.30 |

### PLATES, Carbon Abras. Resist.

| | |
|---|---|
| Claymont,Del. P4 | 7.05 |
| Fontana,Calif. K1 | 7.85 |
| Geneva,Utah C11 | 7.05 |
| Houston S5 | 7.15 |
| Johnstown,Pa. B2 | 7.05 |
| SparrowsPoint,Md. B2 | 7.05 |

### PLATES, Wrought Iron

| | |
|---|---|
| Economy,Pa. B14 | 14.10 |

### PLATES, H.S., L.A.

| | |
|---|---|
| Aliquippa,Pa. J5 | 7.95 |
| Ashland,Ky. A10 | 7.95 |
| Bessemer,Ala. T2 | 7.95 |
| Clairton,Pa. U5 | 7.95 |
| Claymont,Del. P4 | 7.95 |
| Cleveland J5, R2 | 7.95 |
| Coatesville,Pa. L7 | 7.95 |
| Conshohocken,Pa. A3 | 7.95 |
| Economy,Pa. B14 | 7.95 |
| Ecorse,Mich. G5 | 7.95 |
| Fairfield,Ala. T2 | 7.95 |
| Farrell,Pa. S3 | 7.95 |
| Fontana,Calif.(30) K1 | 8.75 |
| Gary,Ind. U5 | 7.95 |
| Geneva,Utah C11 | 7.95 |
| Houston S5 | 8.05 |
| Ind.Harbor,Ind. I-2, Y1 | 7.95 |
| Johnstown,Pa. B2 | 7.95 |
| Munhall,Pa. U5 | 7.95 |
| Pittsburgh J5 | 7.95 |
| Seattle B3 | 8.85 |
| Sharon,Pa. S3 | 7.95 |
| S.Chicago,Ill. U5, W14 | 7.95 |
| SparrowsPoint,Md. B2 | 7.95 |
| Sterling,Ill. N15 | 7.625 |
| Warren,O. R2 | 7.95 |
| Youngstown U5, Y1 | 7.95 |

### PLATES, Alloy

| | |
|---|---|
| Claymont,Del. P4 | 7.50 |
| Coatesville,Pa. L7 | 7.50 |
| Economy,Pa. B14 | 7.50 |
| Farrell,Pa. S3 | 7.50 |
| Fontana,Calif. K1 | 8.30 |
| Gary,Ind. U5 | 7.50 |
| Houston S5 | 7.60 |
| Ind.Harbor,Ind. Y1 | 7.50 |
| Johnstown,Pa. B2 | 7.50 |
| Lowellville,O. S3 | 7.50 |
| Munhall,Pa. U5 | 7.50 |
| Newport,Ky. A2 | 7.50 |
| Pittsburgh J5 | 7.50 |
| Seattle B3 | 8.40 |
| Sharon,Pa. S3 | 7.50 |
| S.Chicago,Ill. U5, W14 | 7.50 |
| SparrowsPoint,Md. B2 | 7.50 |
| Youngstown Y1 | 7.50 |

### PLATES, Ingot Iron

| | |
|---|---|
| Ashland c.l. (15) A10 | 5.55 |
| Ashland l.c.l.(15) A10 | 6.05 |
| Cleveland c.l. R22 | 6.05 |
| Warren,O. R2 | 6.05 |

### FLOOR PLATES

| | |
|---|---|
| Cleveland J5 | 6.375 |
| Claymont,Del. P4 | 6.375 |
| Conshohocken,Pa. A3 | 6.375 |
| Ind.Harbor,Ind. I-2 | 6.375 |
| Munhall,Pa. U5 | 6.375 |
| Pittsburgh J5 | 6.375 |
| S.Chicago,Ill. U5 | 6.375 |

## BARS

### BARS, Hot-Rolled Carbon (Merchant Quality)

| | |
|---|---|
| Ala.City,Ala(9) R2 | 5.675 |
| Aliquippa,Pa.(9) J5 | 5.675 |
| Alton,Ill. L1 | 5.875 |
| Atlanta(9) A11 | 5.875 |
| Bessemer,Ala.(9) T2 | 5.675 |
| Birmingham(9) C15 | 5.675 |
| Buffalo(9) R2 | 5.675 |
| Canton,O.(23) R2 | 6.15 |
| Clairton,Pa.(9) U5 | 5.675 |
| Cleveland(9) R2 | 5.675 |
| Ecorse,Mich.(9) G5 | 5.675 |
| Emeryville,Calif. J7 | 6.425 |
| Fairfield,Ala.(9) T2 | 5.675 |
| Fairless,Pa.(9) U5 | 5.825 |
| Fontana,Calif.(9) K1 | 6.375 |
| Gary,Ind.(9) U5 | 5.675 |
| Houston(9) S5 | 5.925 |
| Ind.Harbor(9) I-2, Y1 | 5.675 |
| Johnstown,Pa.(9) B2 | 5.675 |
| Joliet,Ill. P2 | 5.675 |
| KansasCity,Mo.(9) S5 | 5.925 |
| Lackawanna(9) B2 | 5.675 |
| LosAngeles(9) B3 | 6.375 |
| Massillon,O.(23) R2 | 6.15 |
| Midland,Pa.(23) C18 | 6.025 |
| Milton,Pa. M18 | 5.825 |
| Minnequa,Colo. C10 | 6.125 |
| Niles,Calif. P1 | 6.375 |
| N.Tonawanda S47 | 5.675 |
| Owensboro,Ky.(9) G8 | 6.025 |
| Pittsburg,Calif.(9) C11 | 6.375 |
| Pittsburgh(9) J5 | 5.675 |
| Portland,Oreg. O4 | 6.425 |
| Riverdale,Ill.(9) A1 | 5.675 |
| Seattle(9) A24,B3,N15 | 6.425 |
| S.Ch'c'go(9)R2,U5,W14 | 5.675 |
| S.Duquesne,Pa.(9) U5 | 5.675 |
| S.SanFran.,Calif.(9)B3 | 6.425 |
| Sterling,Ill.(1)(9) N15 | 5.675 |
| Sterling,Ill.(9) N15 | 5.775 |
| Struthers,O.(9) Y1 | 5.675 |
| Tonawanda,N.Y. B12 | 5.675 |
| Torrance,Calif.(9) C11 | 6.375 |
| Warren,O. C17 | 6.025 |
| Youngstown(9) R2, U5 | 5.675 |

### BARS, Hot-Rolled Alloy

| | |
|---|---|
| Aliquippa,Pa. J5 | 6.725 |
| Bethlehem,Pa. B2 | 6.725 |
| Bridgeport,Conn. C32 | 6.80 |
| Buffalo R2 | 6.725 |
| Canton,O. R2, T7 | 6.725 |
| Clairton,Pa. U5 | 6.725 |
| Detroit S41 | 6.725 |
| Economy,Pa. B14 | 6.725 |
| Ecorse,Mich. G5 | 6.725 |
| Farrell,Pa. S3 | 6.725 |
| Fontana,Calif. K1 | 7.775 |
| Gary,Ind. U5 | 6.725 |
| Houston S5 | 6.975 |
| Ind.Harbor,Ind. I-2, Y1 | 6.725 |
| Johnstown,Pa. B2 | 6.725 |
| KansasCity,Mo. S5 | 6.975 |
| Lackawanna,N.Y. B2 | 6.725 |
| LosAngeles B3 | 7.775 |
| Lowellville,O. S3 | 6.725 |
| Massillon,O. R2 | 6.725 |
| Midland,Pa. C18 | 6.725 |
| N. Tonawanda S47 | 6.725 |
| Owensboro,Ky. G8 | 6.725 |
| Pittsburgh J5 | 6.725 |
| Seattle(6) B3 | 7.825 |
| Sharon,Pa. S3 | 6.725 |
| S.Chicago R2, U5, W14 | 6.725 |
| S.Duquesne,Pa. U5 | 6.725 |
| Struthers,O. Y1 | 6.725 |
| Warren,O. C17 | 6.725 |
| Youngstown U5 | 6.725 |

### BARS & SMALL SHAPES, H.R. High-Strength, Low-Alloy

| | |
|---|---|
| Aliquippa,Pa. J5 | 8.30 |
| Bessemer,Ala. T2 | 8.30 |
| Bethlehem,Pa. B2 | 8.30 |
| Clairton,Pa. U5 | 8.30 |
| Cleveland R2 | 8.30 |
| Ecorse,Mich. G5 | 8.30 |
| Fairfield,Ala. T2 | 8.30 |
| Fontana,Calif. K1 | 9.00 |
| Gary,Ind. U5 | 8.30 |
| Houston S5 | 8.55 |
| Ind.Harbor,Ind. Y1 | 8.30 |
| Johnstown,Pa. B2 | 8.30 |
| KansasCity,Mo. S5 | 8.55 |
| Lackawanna,N.Y. B2 | 8.30 |
| LosAngeles B3 | 9.00 |
| Pittsburgh J5 | 8.30 |
| Seattle B3 | 9.05 |
| S.Chicago,Ill. R2, W14 | 8.30 |
| S.Duquesne,Pa. U5 | 8.30 |
| S.SanFrancisco B3 | 9.05 |
| Sterling,Ill. N15 | 7.925 |
| Struthers,O. Y1 | 8.30 |
| Youngstown U5 | 8.30 |

### BAR SIZE ANGLES; H.R. Carbon

| | |
|---|---|
| Bethlehem,Pa.(9) B2 | 5.825 |
| Houston(9) S5 | 5.925 |
| KansasCity,Mo.(9) S5 | 5.925 |
| Lackawanna(9) B2 | 5.675 |
| Sterling,Ill. N15 | 5.775 |
| Sterling,Ill.(1) N15 | 5.675 |
| Tonawanda,N.Y. B12 | 5.675 |

### BAR SIZE ANGLES; S. SHAPES

| | |
|---|---|
| Aliquippa,Pa. J5 | 5.675 |
| Atlanta A11 | 5.875 |
| Joliet,Ill. P22 | 5.675 |
| Minnequa,Colo. C10 | 6.125 |
| Niles,Calif. P1 | 6.375 |
| Pittsburgh J5 | 5.675 |
| Portland,Oreg. O4 | 6.425 |
| SanFrancisco S7 | 6.52 |
| Seattle B3 | 6.425 |

### BAR SIZE ANGLES; S. SHAPES Wrought Iron

| | |
|---|---|
| Economy,Pa. B14 | 16.45 |

### BAR SHAPES, Hot-Rolled Alloy

| | |
|---|---|
| Aliquippa,Pa. J5 | 6.80 |
| Clairton,Pa. U5 | 6.80 |
| Gary,Ind. U5 | 6.80 |
| Houston S5 | 7.05 |
| KansasCity,Mo. S5 | 7.05 |
| Pittsburgh J5 | 6.80 |
| Youngstown U5 | 6.80 |

### BARS, C.F. Leaded (Including leaded extra)

#### Carbon

| | |
|---|---|
| LosAngeles P2, S30 | 11.75* |

#### Alloy

| | |
|---|---|
| Ambridge,Pa. W18 | 10.175 |
| BeaverFalls,Pa. M12 | 10.175 |
| Camden,N.J. P13 | 10.35 |
| Chicago W18 | 10.175 |
| Elyria,O. W8 | 10.175 |
| Monaca,Pa. S17 | 10.175 |
| Newark,N.J. W18 | 10.35 |
| SpringCity,Pa. K3 | 10.35 |

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*Grade A; add 0.5c for Grade B.

### BARS, Cold-Finished Carbon

| | |
|---|---|
| Ambridge,Pa. W18 | 7.65 |
| BeaverFalls,Pa. M12,R2 | 7.65 |
| Birmingham C15 | 8.10 |
| Buffalo B5 | 7.70 |
| Camden,N.J. P13 | 8.10 |
| Carnegie,Pa. C12 | 7.65 |
| Chicago W18 | 7.65 |
| Cleveland A7, C20 | 7.65 |
| Detroit B5, H5, P17 | 7.85 |
| Detroit S41 | 7.65 |
| Donora,Pa. A7 | 7.65 |
| Elyria,O. W8 | 7.65 |
| FranklinPark,Ill. N5 | 7.65 |
| Gary,Ind. R2 | 7.65 |
| GreenBay,Wis. F7 | 7.65 |
| Hammond,Ind. J5, L2 | 7.65 |
| Hartford,Conn. R2 | 8.15 |
| Harvey,Ill. B5 | 7.65 |
| LosAngeles(49) S30 | 9.10 |
| LosAngeles(49) P2, R2 | 9.10 |
| Mansfield,Mass. B5 | 8.20 |
| Massillon,O. R2, R8 | 7.65 |
| Midland,Pa. C18 | 7.65 |
| Monaca,Pa. S17 | 7.65 |
| Newark,N.J. W18 | 8.10 |
| NewCastle,Pa.(17) B4 | 7.65 |
| Pittsburgh J5 | 7.65 |
| Plymouth,Mich. P5 | 7.90 |
| Putnam,Conn. W18 | 8.20 |
| Readville,Mass. C14 | 8.20 |
| Seattle(49) S30 | 9.10 |
| S.Chicago,Ill. W14 | 7.65 |
| SpringCity,Pa. K3 | 8.10 |
| Struthers,O. Y1 | 7.65 |
| Warren,O. C17 | 7.65 |
| Waukegan,Ill. A7 | 7.65 |
| Willimantic,Conn. J5 | 8.15 |
| Youngstown F3, Y1 | 7.65 |

### BARS, Cold-Finished Alloy (Turned and Ground)

| | |
|---|---|
| Cumberland,Md.(5) C19 | 6.55 |

### BARS, Cold-Finished Alloy

| | |
|---|---|
| Ambridge,Pa. W18 | 9.025 |
| BeaverFalls,Pa. M12,R2 | 9.025 |
| Bethlehem,Pa. B2 | 9.025 |
| Bridgeport,Conn. C32 | 9.175 |
| Buffalo B5 | 9.025 |
| Camden,N.J. P13 | 9.20 |
| Canton,O. T7 | 9.025 |
| Carnegie,Pa. C12 | 9.025 |
| Chicago W18 | 9.025 |
| Cleveland A7, C20 | 9.025 |
| Detroit B5, P17 | 9.225 |
| Detroit H5, S41 | 9.025 |
| Donora,Pa. A7 | 9.025 |
| Elyria,O. W8 | 9.025 |
| FranklinPark,Ill. N5 | 9.025 |
| Gary,Ind. R2 | 9.025 |
| GreenBay,Wis. F7 | 9.025 |

| | |
|---|---|
| Hammond,Ind. J5, L2 | 9.025 |
| Hartford,Conn. R2 | 9.325 |
| Harvey,Ill. R5 | 9.025 |
| Lackawanna,N.Y. B3 | 9.025 |
| LosAngeles P2, S30 | 11.00 |
| Mansfield,Mass. B5 | 9.325 |
| Massillon,O. R2, R8 | 9.025 |
| Midland,Pa. C18 | 9.025 |
| Monaca,Pa. S17 | 9.025 |
| Newark,N.J. W18 | 9.20 |
| N.Tonawanda S47 | 9.025 |
| Plymouth,Mich. P5 | 9.225 |
| S.Chicago,Ill. W14 | 9.025 |
| SpringCity,Pa. K3 | 9.20 |
| Struthers,O. Y1 | 9.025 |
| Warren,O. C17 | 9.025 |
| Waukegan,Ill. A7 | 9.025 |
| Willimantic,Conn. J5 | 9.325 |
| Worcester,Mass. A7 | 9.325 |
| Youngstown F3, Y1 | 9.025 |

### BARS, Reinforcing, Billet (To Fabricators)

| | |
|---|---|
| Atlanta A11 | 5.00 |
| Birmingham C15 | 5.25 |
| Ecorse,Mich. G5 | 5.675 |
| Emeryville,Calif. J7 | 6.425 |
| Fontana,Calif. K1 | 6.375 |
| Ind.Harbor,Ind. Y1 | 5.675 |
| Johnstown,Pa. B2 | 5.675 |
| Joliet,Ill. P22 | 5.675 |
| Kokomo,Ind. C16 | 5.775 |
| Lackawanna,N.Y. B2 | 5.675 |
| LosAngeles B3 | 6.375 |
| Madison,Ill. L1 | 5.475 |
| Milton,Pa. M18 | 5.825 |
| Minnequa,Colo. C10 | 6.125 |
| Niles,Calif. P1 | 6.375 |
| Pittsburgh J5 | 5.675 |
| Portland,Oreg. O4 | 6.425 |
| Seattle A24, B3, N14 | 6.425 |
| S.Chicago,Ill. W14 | 5.675 |
| S.SanFrancisco B3 | 6.425 |
| SparrowsPoint,Md. B2 | 5.675 |
| Steelton,Pa. B2 | 5.675 |
| Sterling,Ill. (1) N15 | 5.675 |
| Sterling,Ill. N15 | 5.775 |
| Struthers,O. Y1 | 5.675 |
| Tonawanda,N.Y. B12 | 6.10 |

### BARS, Reinforcing, Billet (Fabricated, to Consumers)

| | |
|---|---|
| Baltimore B2 | 7.42 |
| Boston B2, U8 | 8.15 |
| Chicago U8 | 7.41 |
| Cleveland U8 | 7.39 |
| Johnstown,Pa. B2 | 7.33 |
| Lackawanna,N.Y. B2 | 7.35 |
| Marion,O. P11 | 6.70 |
| Newark,N.J. U8 | 7.80 |
| Philadelphia U8 | 7.63 |
| Pittsburgh J5, U8 | 7.35 |
| Seattle A24, B3, N14 | 7.95 |
| SparrowsPoint,Md. B2 | 7.33 |
| St.Paul U8 | 8.17 |

### BARS, Wrought Iron

| | |
|---|---|
| Economy,Pa.(S.R.)B14 | 16.10 |
| Economy,Pa.(D.R.)B14 | 20.50 |
| Econ.(DirectRolled)B14 | 13.55 |
| Economy(Staybolt)B14 | 20.50 |
| McK.Rks.(S.R.) L5 | 16.10 |
| McK.Rks(D.R.) L5 | 20.50 |
| McK.Rks.(Dir.Rolled)L5 | 13.55 |

### BARS, Rail Steel

| | |
|---|---|
| ChicagoHts.(3) C2, I-2 | 5.575 |
| ChicagoHts.(4)(44) I-2 | 5.675 |
| ChicagoHts.(4) C2 | 5.675 |
| Franklin,Pa.(3) F5 | 5.575 |
| Franklin,Pa.(4) F5 | 5.675 |
| JerseyShore,Pa.(3) J8 | 5.55 |
| Marion,O.(3) P11 | 5.575 |
| Tonawanda(3) B12 | 5.575 |
| Tonawanda(4) B12 | 6.10 |

## SHEETS

### SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

| | |
|---|---|
| AlabamaCity,Ala. R2 | 5.10 |
| Allenport,Pa. P7 | 5.10 |
| Aliquippa,Pa. J5 | 5.10 |
| Ashland,Ky.(8) A10 | 5.10 |
| Cleveland J5, R2 | 5.10 |
| Conshohocken,Pa. A3 | 5.15 |
| Detroit(8) M1 | 5.10 |
| Ecorse,Mich. G5 | 5.10 |
| Fairfield,Ala. T2 | 5.10 |
| Fairless,Pa. U5 | 5.15 |
| Farrell,Pa. S3 | 5.10 |
| Fontana,Calif. K1 | 5.825 |
| Gary,Ind. U5 | 5.10 |
| Geneva,Utah C11 | 5.20 |
| GraniteCity,Ill.(8) G4 | 5.20 |
| Ind.Harbor,Ind. I-2, Y1 | 5.10 |
| Irvin,Pa. U5 | 5.10 |
| Lackawanna,N.Y. B2 | 5.10 |
| Mansfield,O. E6 | 5.10 |
| Munhall,Pa. U5 | 5.10 |
| Newport,Ky. A2 | 5.10 |
| Niles,O. M21, S3 | 5.10 |
| Pittsburg,Calif. C11 | 5.80 |
| Pittsburgh J5 | 5.10 |
| Portsmouth,O. P12 | 5.10 |
| Riverdale,Ill. A1 | 5.10 |
| Sharon,Pa. S3 | 5.10 |
| S.Chicago,Ill. U5, W14 | 5.10 |
| SparowsPoint,Md. B2 | 5.10 |
| Steubenville,O. W10 | 5.10 |
| Warren,O. R2 | 5.10 |
| Weirton,W.Va. W6 | 5.10 |
| Youngstown U5, Y1 | 5.10 |

### SHEETS, H.R. (19 Ga. & Lighter)

| | |
|---|---|
| Niles,O. M21, S3 | 6.275 |

### SHEETS, H.R. Alloy

| | |
|---|---|
| Gary,Ind. U5 | 8.40 |
| Ind.Harbor,Ind. Y1 | 8.40 |
| Irvin,Pa. U5 | 8.40 |
| Munhall,Pa. U5 | 8.40 |
| Newport,Ky. A2 | 8.40 |
| Youngstown U5, Y1 | 8.40 |

### SHEETS, H.R. (14 Ga. & Heavier) High-Strength, Low-Alloy

| | |
|---|---|
| Aliquippa,Pa. J5 | 7.525 |
| Ashland,Ky. A10 | 7.525 |
| Cleveland J5, R2 | 7.525 |
| Conshohocken,Pa. A3 | 7.575 |
| Ecorse,Mich. G5 | 7.525 |
| Fairfield,Ala. T2 | 7.525 |
| Fairless,Pa. U5 | 7.575 |
| Farrell,Pa. S3 | 7.525 |
| Fontana,Calif. K1 | 8.25 |
| Gary,Ind. U5 | 7.525 |
| Ind.Harbor,Ind. I-2, Y1 | 7.525 |
| Irvin,Pa. U5 | 7.525 |
| Lackawanna(35) B2 | 7.525 |
| Munhall,Pa. U5 | 7.525 |
| Niles,O. S3 | 7.525 |
| Pittsburgh J5 | 7.525 |
| S.Chicago,Ill. U5, W14 | 7.525 |
| Sharon,Pa. S3 | 7.525 |
| SparrowsPoint(36) B2 | 7.525 |
| Warren,O. R2 | 7.525 |
| Weirton,W.Va. W6 | 7.525 |
| Youngstown U5, Y1 | 7.525 |

### SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

| | |
|---|---|
| Ashland,Ky.(8) A10 | 5.35 |
| Cleveland R2 | 5.875 |
| Warren,O. R2 | 5.875 |

### SHEETS, Cold-Rolled Ingot Iron

| | |
|---|---|
| Cleveland R2 | 7.05 |
| Middletown,O. A10 | 6.775 |
| Warren,O. R2 | 7.05 |

### SHEETS, Cold-Rolled Steel (Commercial Quality)

| | |
|---|---|
| AlabamaCity,Ala. R2 | 6.275 |
| Aliquippa,Pa. J5 | 6.275 |
| Allenport,Pa. P7 | 6.275 |
| Cleveland J5, R2 | 6.275 |
| Conshohocken,Pa. A3 | 6.325 |
| Detroit M1 | 6.275 |
| Ecorse,Mich. G5 | 6.275 |
| Fairfield,Ala. T2 | 6.275 |
| Fairless,Pa. U5 | 6.325 |
| Follansbee,W.Va. F4 | 6.275 |
| Fontana,Calif. K1 | 7.40 |
| Gary,Ind. U5 | 6.275 |
| GraniteCity,Ill. G4 | 6.375 |
| Ind.Harbor,Ind. I-2, Y1 | 6.275 |
| Irvin,Pa. U5 | 6.275 |
| Lackawanna,N.Y. B2 | 6.275 |
| Mansfield,O. E6 | 6.275 |
| Middletown,O. A10 | 6.275 |
| Newport,Ky. A2 | 6.275 |
| Pittsburg,Calif. C11 | 7.225 |
| Pittsburgh J5 | 6.275 |
| Portsmouth,O. P12 | 6.275 |
| SparrowsPoint,Md. B2 | 6.275 |
| Steubenville,O. W10 | 6.275 |
| Warren,O. R2 | 6.275 |
| Weirton,W.Va. W6 | 6.275 |
| Yorkville,O. W10 | 6.275 |
| Youngstown Y1 | 6.275 |

### SHEETS, Cold-Rolled, High-Strength, Low-Alloy

| | |
|---|---|
| Aliquippa,Pa. J5 | 9.275 |
| Cleveland J5, R2 | 9.275 |
| Ecorse,Mich. G5 | 9.275 |
| Fairless,Pa. U5 | 9.325 |
| Fontana,Calif. K1 | 10.40 |
| Gary,Ind. U5 | 9.275 |
| Ind.Harbor,Ind. I-2, Y1 | 9.275 |
| Lackawanna(38) B2 | 9.275 |
| Pittsburgh J5 | 9.275 |
| SparrowsPoint(33) B2 | 9.275 |
| Warren,O. R2 | 9.275 |
| Weirton,W.Va. W6 | 9.275 |
| Youngstown Y1 | 9.275 |

### SHEETS, Culvert

| | Cu Steel | Cu Fe |
|---|---|---|
| Ala.City,Ala. R2 | 7.125 | .... |
| Ashland,Ky. A10 | 7.125 | 7.375 |
| Canton,O. R2 | 7.125 | .... |
| Fairfield,Ala. T2 | 7.125 | 7.375 |
| Gary,Ind. U5 | 7.125 | 7.375 |
| GraniteCity,Ill.G4 | 7.225 | .... |
| Ind.Harbor I-2 | 7.125 | 7.375 |
| Irvin,Pa. U5 | 7.125 | 7.375 |
| Kokomo,Ind. C16 | 7.225 | .... |
| MartinsFry. W10 | 7.125 | 7.375 |
| Pitts.,Calif. C11 | 7.875 | .... |
| Pittsburgh J5 | 7.125 | .... |
| SparrowsPt. B2 | 7.225 | .... |
| Weirton W6 | 7.125 | .... |

### SHEETS, Culvert—Pure Iron

| | |
|---|---|
| Ind.Harbor,Ind. I-2 | 7.375 |

### SHEETS, Enameling

| | |
|---|---|
| Ashland,Ky. A10 | 6.775 |
| Cleveland R2 | 6.775 |
| Fairfield,Ala. T2 | 6.775 |
| Gary,Ind. U5 | 6.775 |
| Ind.Harbor,Ind. I-2, Y1 | 6.775 |
| Irvin,Pa. U5 | 6.775 |
| Middletown,O. A10 | 6.775 |
| Niles,O. M21, S3 | 6.775 |
| SparrowsPoint,Md. B2 | 6.775 |
| Youngstown Y1 | 6.775 |

### BLUED STOCK, 29 Gage

| | |
|---|---|
| Dover,O. E6 | 8.70 |
| Ind.Harbor,Ind. I-2 | 8.70 |
| Mansfield,O. E6 | 8.70 |
| Warren,O. R2 | 8.70 |
| Yorkville,O. W10 | 8.70 |

### SHEETS, Long Terne, Steel

| | |
|---|---|
| Follansbee,W.Va. W10 | 7.225 |
| Gary,Ind. U5 | 7.225 |
| Mansfield,O. E6 | 7.225 |
| Middletown,O. A10 | 7.225 |
| Niles,O. M21, S3 | 7.225 |
| Warren,O. R2 | 7.225 |

### SHEETS, Long Terne, Ingot Iron

| | |
|---|---|
| Middletown,O. A10 | 7.625 |

### SHEETS, Aluminum Coated

| | |
|---|---|
| Butler,Pa. A10 (type 1) | 9.525 |
| Butler,Pa. A10 (type 2) | 9.625 |
| Irvin,Pa. U5 (type 1) | 9.525 |

### SHEETS, Well Casing

| | |
|---|---|
| Fontana,Calif. K1 | 7.325 |
| Geneva,Utah C11 | 6.80 |

### SHEETS, Galvanized High-Strength, Low Alloy

| | |
|---|---|
| Irvin,Pa. U5 | 10.125 |
| Pittsburgh J5 | 10.125 |
| SparrowsPt.(39) B2 | 10.025 |

### SHEETS, Galvannealed Steel

| | |
|---|---|
| Canton,O. R2 | 7.175 |
| Irvin,Pa. U5 | 7.175 |

### SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

| | |
|---|---|
| Ashland,Ky. A10 | 7.125 |
| Middletown,O. A10 | 7.125 |

### SHEETS, Electrogalvanized

| | |
|---|---|
| Canfield,O. C3 | 7.50 |
| Cleveland (28) R2 | 7.65 |
| Niles,O. (28) R2 | 7.65 |
| Weirton,W.Va. W6 | 7.50 |

### SHEETS, Galvanized Steel Hot-Dipped§

| | |
|---|---|
| AlabamaCity,Ala, R2 | 6.875‡ |
| Ashland,Ky. A10 | 6.875‡ |
| Canton,O. R2 | 6.875‡ |
| Dover,O. E6 | 6.875† |
| Fairfield,Ala. T2 | 6.875† |
| Gary,Ind. U5 | 6.875† |
| GraniteCity,Ill. G4 | 6.975* |
| Ind.H'rb'r,Ind. I-2, Y1 | 6.875† |
| Irvin,Pa. U5 | 6.875† |
| Kokomo,Ind. C16 | 6.975‡ |
| MartinsFerry,O. W10 | 6.875* |
| Middletown,O A10 | 6.875† |
| Pittsburg,Calif. C11 | 7.625* |
| Pittsburgh J5 | 6.875† |
| SparrowsPt.,Md. B2 | 6.875† |
| Warren,O. R2 | 6.875† |
| Weirton,W.Va. W6 | 6.875* |

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*Continuous and noncontinuous. †Continuous. ‡Noncontinuous. §For minimum spangled add 0.15c.

## Key to Producers

| | |
|---|---|
| A1 | Acme Steel Co. |
| A2 | Acme-Newport Steel Co. |
| A3 | Alan Wood Steel Co. |
| A4 | Allegheny Ludlum Steel |
| A5 | Alloy Metal Wire Div., H. K. Porter Co. Inc. |
| A6 | American Shim Steel Co. |
| A7 | American Steel & Wire Div., U. S. Steel Corp. |
| A8 | Anchor Drawn Steel Co. |
| A9 | Angell Nail & Chaplet |
| A10 | Armco Steel Corp. |
| A11 | Atlantic Steel Co. |
| A25 | Algoma Steel Corp. Ltd. |
| B1 | Babcock & Wilcox |
| B2 | Bethlehem Steel Co. |
| B3 | Bethlehem Steel Co., Pacific Coast Div. |
| B4 | Blair Strip Steel Co. |
| B5 | Bliss & Laughlin Inc. |
| B8 | Braeburn Alloy Steel |
| B9 | Brainard Steel Div., Sharon Steel Corp. |
| B10 | E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron |
| B12 | Buffalo Steel Corp. |
| B14 | A. M. Byers Co. |
| B15 | J. Bishop & Co. |
| C1 | Calstrip Steel Corp. |
| C2 | Calumet Steel Div., Borg-Warner Corp. |
| C3 | Canfield Steel Co. |
| C4 | Carpenter Steel Co. |
| C9 | Colonial Steel Co. |
| C10 | Colorado Fuel & Iron |
| C11 | Columbia-Geneva Steel |
| C12 | Columbia Steel & Shaft. |
| C13 | Columbia Tool Steel Co. |
| C14 | Compressed Steel Shaft. |
| C15 | Connors Steel Div., H. K. Porter Co., Inc. |
| C16 | Continental Steel Corp. |
| C17 | Copperweld Steel Co. |
| C18 | Crucible Steel Co. |
| C19 | Cumberland Steel Co. |
| C20 | Cuyahoga Steel & Wire Div., Hoover Ball & Bearing |
| C23 | Charter Wire Inc. |
| C24 | G. O. Carlson Inc. |
| C32 | Carpenter Steel of N.Eng. |
| D2 | Detroit Steel Corp. |
| D4 | Disston Div., H. K. Porter Co. Inc. |
| D6 | Driver-Harris Co. |
| D7 | Dickson Weatherproof Nail Co. |
| D8 | Damascus Tube Co. |
| D9 | Wilbur B. Driver Co. |
| E2 | Eastern Stainless Steel |
| E6 | Empire-Reeves Steel |
| E10 | Enamel Prod. & Plating |
| F2 | Firth Sterling Inc. |
| F3 | Fitzsimons Steel Co. |
| F5 | Franklin Steel Div., Borg-Warner Corp. |
| F6 | Fretz-Moon Tube Co. |
| F7 | Ft. Howard Steel & Wire |
| F8 | Ft. Wayne Metals Inc. |
| G4 | Granite City Steel Co. |
| G5 | Great Lakes Steel Corp. |
| G6 | Greer Steel Co. |
| G8 | Green River Steel Corp. |
| H1 | Hanna Furnace Corp. |
| H5 | Hercules Drawn Steel |
| H7 | Helical Tube Co. |
| I-1 | Igoe Bros. Inc. |
| I-2 | Inland Steel Co. |
| I-3 | Interlake Iron Corp. |
| I-4 | Ingersoll Steel Div., Borg-Warner Corp. |
| I-6 | Ivins Steel Tube Works |
| I-7 | Indiana Steel & Wire Co. |
| J1 | Jackson Iron & Steel Co. |
| J3 | Jessop Steel Co. |
| J4 | Johnson Steel & Wire Co. |
| J5 | Jones & Laughlin Steel |
| J6 | Joslyn Mfg. & Supply |
| J7 | Judson Steel Corp. |
| J8 | Jersey Shore Steel Co. |
| J10 | Jay Steel Corp. |
| K1 | Kaiser Steel Corp. |
| K2 | Keokuk Electro-Metals |
| K3 | Keystone Drawn Steel |
| K4 | Keystone Steel & Wire |
| L1 | Laclede Steel Co. |
| L2 | LaSalle Steel Co. |
| L3 | Latrobe Steel Co. |
| L5 | Lockhart Iron & Steel |
| L6 | Lone Star Steel Co. |
| L7 | Lukens Steel Co. |
| L8 | Leschen Wire Rope Div., H. K. Porter Co. Inc. |
| M1 | McLouth Steel Corp. |
| M4 | Mahoning Valley Steel |
| M6 | Mercer Pipe Div., Sawhill Tubular Products |
| M8 | Mid-States Steel & Wire |
| M12 | Moltrup Steel Products |
| M14 | McInnes Steel Co. |
| M16 | Md. Fine & Specialty Wire Co. Inc. |
| M17 | Metal Forming Corp. |
| M18 | Milton Steel Div., Merritt-Chapman&Scott |
| M21 | Mallory-Sharon Metals Corp. |
| M22 | Mill Strip Products Co. |
| M23 | Mill Strip Products Co. of Pennsylvania |
| N1 | National Standard Co. |
| N2 | National Supply, Armco Steel Corp. |
| N3 | National Tube Div., U. S. Steel Corp. |
| N5 | Nelsen Steel & Wire Co. |
| N6 | New England High Carbon Wire Co. |
| N8 | Newman-Crosby Steel |
| N14 | Northwest. Steel Rolling Mills Inc. |
| N15 | Northwestern S.&W. Co. |
| N17 | National Steel Corp. |
| N20 | Neville Ferro Alloy Co. |
| O1 | Ohio Ferro-Alloys Corp. |
| O4 | Oregon Steel Mills |
| P1 | Pacific States Steel Corp. |
| P2 | Pacific Tube Co. |
| P4 | Phoenix Steel Corp. |
| P5 | Pilgrim Drawn Steel |
| P6 | Pittsburgh Coke & Chem. |
| P7 | Pittsburgh Steel Co. |
| P11 | Pollak Steel Co. |
| P12 | Portsmouth Div., Detroit Steel Corp. |
| P13 | Precision Drawn Steel |
| P15 | Pittsburgh Metallurgical |
| P16 | Page Steel & Wire Div., American Chain & Cable |
| P17 | Plymouth Steel Corp. |
| P19 | Pitts. Rolling Mills |
| P20 | Prod. Steel Strip Corp. |
| P22 | Phoenix Mfg. Co. |
| P25 | Phil. Steel & Wire Corp. |
| R2 | Republic Steel Corp. |
| R5 | Roebling's Sons, John A. |
| R6 | Rome Strip Steel Co. |
| R8 | Reliance Div., Eaton Mfg. |
| R9 | Rome Mfg. Co. |
| R10 | Rodney Metals Inc. |
| S1 | Seneca Wire & Mfg. Co. |
| S3 | Sharon Steel Corp. |
| S4 | Sharon Tube Co. |
| S5 | Sheffield Div. Armco Steel Corp. |
| S6 | Shenango Furnace Co. |
| S7 | Simmons Co. |
| S8 | Simonds Saw & Steel Co. |
| S12 | Spencer Wire Corp. |
| S13 | Standard Forgings Corp. |
| S14 | Standard Tube Co. |
| S15 | Stanley Works |
| S17 | Superior Drawn Steel Co. |
| S18 | Superior Steel Div., Copperweld Steel Co. |
| S19 | Sweet's Steel Co. |
| S20 | Southern States Steel |
| S23 | Superior Tube Co. |
| S25 | Stainless Welded Prod. |
| S26 | Specialty Wire Co. Inc. |
| S30 | Sierra Drawn Steel Div., Bliss & Laughlin Inc. |
| S31 | Sawhill Tubular Products |
| S40 | Seneca Steel Service |
| S41 | Stainless & Strip Div., J & L Steel Corp. |
| S42 | Southern Elec. Steel Co. |
| S43 | Seymour Mfg. Co. |
| S44 | Screw & Bolt Corp. of America |
| S45 | Somers Brass Co. |
| S46 | Steel Co. of Canada |
| S47 | Seaway Steel Div., Roblin-Seaway Industries |
| T2 | Tenn. Coal & Iron Div. U. S. Steel Corp. |
| T3 | Tenn. Products & Chemical |
| T4 | Texas Steel Co. |
| T5 | Thomas Strip Div., Pittsburgh Steel Co. |
| T6 | Thompson Wire Co. |
| T7 | Timken Roller Bearing |
| T9 | Tonawanda Iron Div., Am. Rad. & Stan. San. |
| T13 | Tube Methods Inc. |
| T19 | Techalloy Co. Inc. |
| U3 | Union Wire Rope, Armco Steel Corp. |
| U4 | Universal-Cyclops Steel |
| U5 | U. S. Steel Corp. |
| U6 | U. S. Pipe & Foundry |
| U7 | Ulbrich Stainless Steels |
| U8 | U. S Steel Supply Div., U. S. Steel Corp. |
| U11 | Union Carbide Metals Co. |
| U13 | Union Steel Corp. |
| V2 | Vanadium-Alloy Steel |
| V3 | Vulcan Kidd Steel Div., H. K. Porter Co. |
| W1 | Wallace Barnes Steel Div., Associated Spring |
| W2 | Wallingford Steel Co. |
| W3 | Washburn Wire Co. |
| W4 | Washington Steel Corp. |
| W6 | Weirton Steel Div., National Steel Corp. |
| W8 | Western Cold Drawn Steel Div., Standard Screw Co. |
| W9 | Wheatland Tube Co. |
| W10 | Wheeling Steel Corp. |
| W12 | Wickwire Spencer Steel Div., Colo. Fuel & Iron |
| W13 | Wilson Steel & Wire Co. |
| W14 | Wisconsin Steel Div., International Harvester |
| W15 | Woodward Iron Co. |
| W18 | Wyckoff Steel Co. |
| Y1 | Youngstown Sheet & Tube |

## STRIP

### STRIP, Hot-Rolled Carbon

| | |
|---|---|
| Ala.City,Ala.(27) R2 | 5.10 |
| Allenport,Pa. P7 | 5.10 |
| Alton,Ill. L1 | 5.30 |
| Ashland,Ky.(8) A10 | 5.10 |
| Atlanta A11 | 5.10 |
| Bessemer,Ala. T2 | 5.10 |
| Birmingham C15 | 5.10 |
| Conshohocken,Pa. A3 | 5.15 |
| Detroit M1 | 5.10 |
| Ecorse,Mich. G5 | 5.10 |
| Fairfield,Ala. T2 | 5.10 |
| Farrell,Pa. S3 | 5.10 |
| Fontana,Calif. K1 | 5.825 |
| Gary,Ind. U5 | 5.10 |
| Ind.Harbor,Ind. I-2, Y1 | 5.10 |
| Johnstown,Pa.(25) B2 | 5.10 |
| Lackaw'na,N.Y.(25) B2 | 5.10 |
| LosAngeles(25) B3 | 5.85 |
| LosAngeles C1 | 8.60 |
| Minnequa,Colo. C10 | 6.20 |
| Riverdale,Ill. A1 | 5.10 |
| SanFrancisco S7 | 6.60 |
| Seattle(25) B3 | 6.10 |
| Seattle N14 | 6.60 |
| Sharon,Pa. S3 | 5.10 |
| S.Chicago,Ill. W14 | 5.10 |
| S.SanFrancisco(25) B3 | 5.85 |
| SparrowsPoint,Md. B2 | 5.10 |
| Torrance,Calif. C11 | 5.85 |
| Warren,O. R2 | 5.10 |
| Weirton,W.Va. W6 | 5.10 |
| Youngstown U5, Y1 | 5.10 |

### STRIP, Hot-Rolled Alloy

| | |
|---|---|
| Carnegie,Pa. S18 | 8.40 |
| Farrell,Pa. S3 | 8.40 |
| Gary,Ind. U5 | 8.40 |
| Houston S5 | 8.65 |
| Ind.Harbor,Ind. Y1 | 8.40 |
| KansasCity,Mo. S5 | 8.65 |
| LosAngeles B3 | 9.60 |
| Lowellville,O. S3 | 8.40 |
| Newport,Ky. A2 | 8.40 |
| Sharon,Pa. A2, S3 | 8.40 |
| S.Chicago,Ill. W14 | 8.40 |
| Youngstown U5, Y1 | 8.40 |

### STRIP, Hot-Rolled High-Strength, Low-Alloy

| | |
|---|---|
| Ashland,Ky. A10 | 7.575 |
| Bessemer,Ala. T2 | 7.575 |
| Conshohocken,Pa. A3 | 7.575 |
| Ecorse,Mich. G5 | 7.575 |
| Fairfield,Ala. T2 | 7.575 |
| Farrell,Pa. S3 | 7.575 |
| Gary,Ind. U5 | 7.575 |
| Ind.Harbor,Ind. I-2,Y1 | 7.575 |
| Lackawanna,N.Y. B2 | 7.575 |
| LosAngeles(25) B3 | 8.325 |
| Seattle(25) B3 | 8.575 |
| Sharon,Pa. S3 | 7.575 |
| S.Chicago,Ill. W14 | 7.575 |
| S.SanFrancisco(25) B3 | 8.325 |
| SparrowsPoint,Md. B2 | 7.575 |
| Warren,O. R2 | 7.575 |
| Weirton,W.Va. W6 | 7.575 |
| Youngstown U5, Y1 | 7.575 |

### STRIP, Hot-Rolled Ingot Iron

| | |
|---|---|
| Ashland,Ky.(8) A10 | 5.35 |
| Warren,O. R2 | 5.875 |

### STRIP, Cold-Rolled Carbon

| | |
|---|---|
| Anderson,Ind. G6 | 7.425 |
| Baltimore T6 | 7.425 |
| Boston T6 | 7.975 |
| Buffalo S40 | 7.425 |
| Cleveland A7 | 7.425 |
| Dearborn,Mich. S3 | 7.425 |
| Detroit D2, M1, P20 | 7.425 |
| Dover,O. G6 | 7.425 |
| Evanston,Ill. M22 | 7.425 |
| Farrell,Pa. S3 | 7.425 |
| Follansbee,W.Va. W10 | 7.425 |
| Fontana,Calif. K1 | 9.20 |
| FranklinPark,Ill. T6 | 7.425 |
| Ind.Harbor,Ind. Y1 | 7.425 |
| Indianapolis S41 | 7.575 |
| LosAngeles C1, S41 | 9.30 |
| McKeesport,Pa. E10 | 7.525 |
| NewBedford,Mass. R10 | 7.875 |
| NewBritain,Conn. S15 | 7.875 |
| NewCastle,Pa. B4, M23 | 7.425 |
| NewHaven,Conn. D2 | 7.875 |
| NewKensington,Pa. A6 | 7.425 |
| Pawtucket,R.I. R3, N8 | 7.975 |
| Philadelphia P24 | 7.875 |
| Riverdale,Ill. A1 | 7.425 |
| Rome,N.Y.(32) R6 | 7.425 |
| Sharon,Pa. S3 | 7.425 |
| Trenton,N.J.(31) R5 | 8.875 |
| Warren,O. R2, T5 | 7.425 |
| Worcester,Mass. A7 | 7.975 |
| Youngstown S41, Y1 | 7.425 |

### STRIP, Cold-Rolled Alloy

| | |
|---|---|
| Boston T6 | 15.90 |
| Carnegie,Pa. S18 | 15.55 |
| Cleveland A7 | 15.55 |
| Dover,O. G6 | 15.55 |
| Farrell,Pa. S3 | 15.55 |
| FranklinPark,Ill. T6 | 15.55 |
| Harrison,N.J. S18 | 15.55 |
| Indianapolis S41 | 15.70 |
| LosAngeles S41 | 17.75 |
| Lowellville,O. S3 | 15.55 |
| Pawtucket,R.I. S8 | 15.90 |
| Riverdale,Ill. A1 | 15.55 |
| Sharon,Pa. S3 | 15.55 |
| Worcester,Mass. A7 | 15.85 |
| Youngstown S41 | 15.55 |

### STRIP, Cold-Rolled High-Strength, Low-Alloy

| | |
|---|---|
| Cleveland A7 | 10.80 |
| Dearborn,Mich. S3 | 10.80 |
| Dover,O. G6 | 10.80 |
| Farrell,Pa. S3 | 10.80 |
| Ind.Harbor,Ind. Y1 | 10.80 |
| Sharon,Pa. S3 | 10.80 |
| Warren,O. R2 | 10.80 |
| Weirton,W.Va. W6 | 10.80 |
| Youngstown Y1 | 10.80 |

### STRIP, Galvanized (Continuous)

| | |
|---|---|
| Farrell,Pa. S3 | 7.50 |
| Sharon,Pa. S3 | 7.50 |

### STRIP, C. R., Electrogalvanized

| | |
|---|---|
| Cleveland A7 | 7.425* |
| Dover,O. G6 | 7.425* |
| Evanston,Ill. M22 | 7.525* |
| McKeesport,Pa. E10 | 7.50* |
| NewCastle,Pa. M23 | 7.425* |
| Riverdale,Ill. A1 | 7.425* |
| Warren,O. B9, S3, T5 | 7.425* |
| Worcester,Mass. A7 | 7.975 |
| Youngstown S41 | 7.425* |

*Plus galvanizing extras.

### STRIP, Cold-Rolled Ingot Iron

| | |
|---|---|
| Warren,O. R2 | 8.175 |

### TIGHT COOPERAGE HOOP

| | |
|---|---|
| Atlanta A11 | 5.825 |
| Farrell,Pa. S3 | 5.525 |
| Riverdale,Ill. A1 | 5.675 |
| Sharon,Pa. S3 | 5.525 |
| Youngstown U5 | 5.525 |

### STRIP, Cold-Finished Spring Steel (Annealed)

| | 0.26-0.40C | 0.41-0.60C | 0.61-0.80C | 0.81-1.05C | 1.06-1.35C |
|---|---|---|---|---|---|
| Anderson,Ind. G6 | 9.10 | .... | .... | .... | .... |
| Baltimore T6 | 9.50 | 10.70 | 12.90 | 15.90 | 18.85 |
| Boston T6 | 9.50 | 10.70 | 12.90 | 15.90 | 18.85 |
| Bristol,Conn. W1 | .... | 10.70 | 12.90 | 16.10 | 19.30 |
| Carnegie,Pa. S18 | 8.95 | 10.40 | 12.60 | 15.60 | .... |
| Cleveland A7 | 8.95 | 10.40 | 12.60 | 15.60 | 18.55 |
| Dearborn,Mich. S3 | 9.05 | 10.50 | 12.70 | .... | .... |
| Detroit D2 | 9.05 | 10.50 | 12.70 | 15.70 | .... |
| Dover,O. G6 | 8.95 | 10.40 | 12.60 | 15.60 | 18.55 |
| Evanston,Ill. M22 | 9.05 | 10.40 | 12.60 | 15.60 | .... |
| Farrell,Pa. S3 | 8.95 | 10.40 | 12.60 | 15.60 | 18.55 |
| Fostoria,O. S1 | 10.05 | 10.40 | 12.60 | 15.60 | .... |
| FranklinPark,Ill. T6 | 9.05 | 10.40 | 12.60 | 15.60 | 18.55 |
| Harrison,N.J. C18 | .... | .... | 12.90 | 16.10 | 19.30 |
| Indianapolis S41 | 9.10 | 10.55 | 12.60 | 15.60 | 18.55 |
| LosAngeles C1 | 11.15 | 12.60 | 14.80 | 17.80 | .... |
| LosAngeles S41 | 11.15 | 12.60 | 14.80 | .... | .... |
| NewBritain,Conn. S15 | 9.40 | 10.70 | 12.90 | 15.90 | 18.85 |
| NewCastle,Pa. B4, M23 | 8.95 | 10.40 | 12.60 | 15.60 | .... |
| NewHaven,Conn. D2 | 9.40 | 10.70 | 12.90 | 15.90 | .... |
| NewKensington,Pa. A6 | 8.95 | 10.40 | 12.60 | 15.60 | .... |
| NewYork W3 | .... | 10.70 | 12.90 | 16.10 | 19.30 |
| Pawtucket,R.I. N8 | 9.50 | 10.70 | 12.90 | 15.90 | 18.85 |
| Riverdale,Ill. A1 | 9.05 | 10.40 | 12.60 | 15.60 | 18.55 |
| Rome,N.Y. R6 | 8.95 | 10.40 | 12.60 | 15.60 | 18.55 |
| Sharon,Pa. S3 | 8.95 | 10.40 | 12.60 | 15.60 | 18.55 |
| Trenton,N.J. R5 | .... | 10.70 | 12.90 | 15.90 | 18.85 |
| Warren,O. T5 | 8.95 | 10.40 | 12.60 | 15.60 | 18.55 |
| Worcester,Mass. A7, T6 | 9.50 | 10.70 | 12.90 | 15.90 | 18.85 |
| Youngstown S41 | 8.95 | 10.40 | 12.60 | 15.60 | 18.55 |

### Spring Steel (Tempered)

| | | | Up to 0.80C | 0.81-1.05C | 1.06-1.35C |
|---|---|---|---|---|---|
| Bristol,Conn. W1 | ... | ... | 18.85 | 22.95 | 27.80 |
| Buffalo W12 | ... | ... | 18.85 | .... | .... |
| Fostoria,O. S1 | ... | ... | 19.05 | 22.15 | .... |
| FranklinPark,Ill. T6 | ... | ... | 19.20 | 23.30 | 28.15 |
| Harrison,N.J. C18 | ... | ... | 18.85 | 22.95 | 27.80 |
| NewYork W3 | ... | ... | 18.85 | 22.95 | 27.80 |
| Palmer,Mass. W12 | ... | ... | 18.85 | .... | .... |
| Trenton,N.J. R5 | ... | ... | 18.85 | 22.95 | 27.80 |
| Worcester,Mass. A7, T6 | ... | ... | 18.85 | 22.95 | 27.80 |
| Youngstown S41 | ... | ... | 19.20 | 23.30 | 28.15 |

## TIN MILL PRODUCTS

### ELECTROLYTIC THIN TIN PLATE (¼ lb coating in coils)

| | Basis Weight 45 lb | 50 lb | 55 lb | 60 lb |
|---|---|---|---|---|
| Fairfield,Ala. T2 | $6.10 | $6.25 | $6.40 | $6.55 |
| Fairless,Pa. U5 | 6.10 | 6.25 | 6.40 | 6.55 |
| Gary,Ind. U5 | 6.10 | 6.25 | 6.40 | 6.55 |
| IndianaHarbor,Ind. I-2 | 6.10 | 6.25 | 6.40 | 6.55 |
| Irwin,Pa. U5 | 6.10 | 6.25 | 6.40 | 6.55 |
| SparrowsPoint,Md. B2 | 6.10 | 6.25 | 6.40 | 6.55 |
| Weirton,W.Va. W6 | 6.10 | 6.25 | 6.40 | 6.55 |

### TIN PLATE, Electrolytic (100 lb basis wt)

| | 0.25 lb Coating |
|---|---|
| Aliquippa,Pa. J5 | $9.10 |
| Fairfield,Ala. T2 | 9.10 |
| Fairless,Pa. U5 | 9.10 |
| Fontana,Calif. K1 | 9.75 |
| Gary,Ind. U5 | 9.10 |
| GraniteCity,Ill. G4 | 9.20 |
| Ind.Harb.,Ind. I-2, Y1 | 9.10 |
| Irvin,Pa. U5 | 9.10 |
| Niles,O. R2 | 9.10 |
| Pittsburg,Calif. C11 | 9.75 |
| SparrowsPt.,Md. B2 | 9.10 |
| Weirton,W.Va. W6 | 9.10 |
| Yorkville,O. W10 | 9.10 |

### BLACK PLATE (Base Box)

| | |
|---|---|
| Aliquippa,Pa. J5 | $8.20 |
| Fairfield,Ala. T2 | 8.20 |
| Fairless,Pa. U5 | 8.20 |
| Fontana,Calif. K1 | 8.85 |
| Gary,Ind. U5 | 8.20 |
| GraniteCity,Ill. G4 | 8.30 |
| Ind.Harbor,Ind. I-2, Y1 | 8.20 |
| Irvin,Pa. U5 | 8.20 |
| Niles,O. R2 | 8.20 |
| Pittsburg,Calif. C11 | 8.85 |
| SparrowsPoint,Md. B2 | 8.20 |
| Weirton,W.Va. W6 | 8.20 |
| Yorkville,O. W10 | 8.20 |

### ELECTRO. TIN-COATED SHEET

(20-27 gage; per 100 lb)

| | |
|---|---|
| IndianaHarb.,Ind. Y1 | $7.90 |

(21-27 gage; per 100 lb)

| | |
|---|---|
| Aliquippa,Pa. J5 | $7.90 |
| Niles,O. R2 | 7.90 |

### TIN PLATE, HOT DIPPED COMMON COKE

| | 1.25 lb | 1.50 lb |
|---|---|---|
| Aliquippa,Pa. J5 | $10.40 | $10.65 |
| Fairfield,Ala. T2 | 10.40 | 10.65 |
| Fairless,Pa. U5 | 10.40 | 10.65 |
| Fontana,Calif. K1 | 11.05 | 11.30 |
| Gary,Ind. U5 | 10.40 | 10.65 |
| Irvin,Pa. U5 | 10.40 | 10.65 |
| Pitts.,Calif. C11 | 11.05 | 11.30 |
| Sp.Pt.,Md. B2 | 10.40 | 10.65 |
| Weirton,W.Va.W6 | 10.40 | 10.65 |
| Yorkville,O. W10 | 10.40 | 10.65 |

### HOLLOWARE ENAMELING (Black plate) (29 Gage)

| | |
|---|---|
| Aliquippa,Pa. J5 | 7.85 |
| Gary,Ind. U5 | 7.85 |
| GraniteCity,Ill. G4 | 7.95 |
| Ind.Harbor,Ind. Y1 | 7.85 |
| Irvin,Pa. U5 | 7.85 |
| Yorkville,O. W10 | 7.85 |

## SILICON STEEL

### C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed ½c lower)

| | Field | Armature | Electric | Motor | Dynamo |
|---|---|---|---|---|---|
| BeechBottom,W.Va. W10 | .... | 11.70 | 12.40 | 13.35 | 14.65 |
| Brackenridge,Pa. A4 | .... | .... | 12.40 | 13.55 | 14.65 |
| GraniteCity,Ill. G4 | 9.975* | 11.30* | 12.00* | 13.15* | .... |
| IndianaHarbor,Ind. I-2 | 9.875* | 11.20* | 11.90* | 13.05* | .... |
| Mansfield,O. E6 | 9.875* | 11.70 | 12.40 | 13.55 | 14.65 |
| Newport,Ky. A2 | 9.875 | 11.70* | 12.40* | 13.55* | 14.65* |
| Niles,O. M21 | 9.875* | 11.70 | 12.40 | 13.55 | .... |
| Vandergrift,Pa. U5 | 9.875* | 11.70 | 12.40 | 13.55 | 14.65 |
| Warren,O. R2 | 9.875* | 11.70 | 12.40 | 13.55 | 14.65 |
| Zanesville,O. A10 | .... | 11.70† | 12.40 | 13.55 | 14.65 |

| | Stator |
|---|---|
| Mansfield,O. E6 | 8.10 |
| Vandergrift,Pa. U5 | 8.10 |
| Warren,O. R2 (Locore) | 8.10 |

### SHEETS (22 Ga., coils & cut lengths)

Fully Processed (Semiprocessed ½c lower)

| | T-72 | T-65 | T-58 | T-52 |
|---|---|---|---|---|
| BeechBottom,W.Va. W10 | 15.70 | 16.30 | 16.80 | 17.85 |
| Vandergrift,Pa. U5 | 15.70 | 16.30 | 16.80 | 17.85 |
| Zanesville,O. A10 | 15.70 | 16.30 | 16.80 | 17.85 |

### C.R. COILS & CUT LENGTHS (22 Ga.)

| | Grain Oriented T-100 | T-90 | T-80 | T-73 | T-66 | T-72 |
|---|---|---|---|---|---|---|
| Brackenridge,Pa. A4 | .. | 18.10 | 19.70 | 20.20 | 20.70 | 15.70†† |
| Butler,Pa. A10 | .... | .... | 19.70 | 20.20 | 20.70 | .... |
| Vandergrift,Pa. U5 | 17.10 | 18.10 | 19.70 | 20.20 | 20.70 | 15.70 |
| Warren,O. R2 | .... | .... | .... | .... | .... | 15.70‡ |

*Semiprocessed. †Fully processed only. §Coil annealed; semiprocessed ½c lower. ††Coils only.

## WIRE

### WIRE, Manufacturers Bright, Low Carbon

| | |
|---|---|
| AlabamaCity,Ala. R2 | 8.00 |
| Aliquippa,Pa. J5 | 8.00 |
| Alton,Ill. L1 | 8.20 |
| Atlanta A1 | 8.00 |
| Bartonville,Ill. K4 | 8.10 |
| Buffalo W12 | 8.00 |
| Chicago W13 | 8.00 |
| Cleveland A7, C20 | 8.00 |
| Crawfordsville,Ind. M8 | 8.10 |
| Donora,Pa. A7 | 8.00 |
| Duluth A7 | 8.00 |
| Fairfield,Ala. T2 | 8.00 |
| Fostoria,O.(24) S1 | 8.10 |
| Houston S5 | 8.25 |
| Jacksonville,Fla. M8 | 8.35 |
| Johnstown,Pa. B2 | 8.00 |
| Joliet,Ill. A7 | 8.00 |
| KansasCity,Mo. S5 | 8.25 |
| Kokomo,Ind. C16 | 8.10 |
| LosAngeles B3 | 8.95 |
| Minnequa,Colo. C10 | 8.25 |
| Monessen,Pa. P7, P16 | 8.00 |
| N.Tonawanda S47 | 8.00 |
| Palmer,Mass. W12 | 8.30 |
| Pittsburg,Calif. C11 | 8.95 |
| Portsmouth,O. P12 | 8.00 |
| S.Chicago,Ill. R2 | 8.00 |
| S.SanFrancisco C10 | 8.95 |
| SparrowsPoint,Md. B2 | 8.10 |
| Sterling,Ill.(1) N15 | 8.00 |
| Sterling,Ill. N15 | 8.10 |
| Struthers,O. Y1 | 8.00 |
| Waukegan,Ill. A7 | 8.00 |
| Worcester,Mass. A7 | 8.30 |

### WIRE, Cold Heading Carbon

| | |
|---|---|
| Elyria,O. W8 | 8.00 |
| N.Tonawanda S47 | 8.00 |

### WIRE, Gal'd., for ACSR

| | |
|---|---|
| Bartonville,Ill. K4 | 12.65 |
| Buffalo W12 | 13.40 |
| Cleveland A7 | 12.65 |
| Donora,Pa. A7 | 12.65 |
| Duluth A7 | 12.65 |
| Johnstown,Pa.(10) B2 | 12.65 |
| KansasCity,Mo. U3 | 12.90 |
| LosAngeles(2) B3 | 13.60 |
| Minnequa,Colo. C10 | 12.775 |
| Monessen,Pa. P7, P16 | 12.65 |
| Muncie,Ind. I-7 | 13.60 |
| NewHaven,Conn. A7 | 12.95 |
| Palmer,Mass. W12 | 13.70 |
| Pittsburg,Calif. C11 | 13.45 |
| Portsmouth,O. P12 | 12.65 |
| Roebling,N.J. R5 | 12.95 |
| SparrowsPt.,Md.(10)B2 | 12.75 |
| Struthers,O. Y1 | 13.40 |
| Trenton,N.J. A7 | 12.95 |
| Waukegan,Ill. A7 | 12.65 |
| Worcester,Mass. A7 | 12.95 |

### WIRE, Upholstery Spring

| | |
|---|---|
| Aliquippa,Pa. J5 | 9.75 |
| Alton,Ill. L1 | 9.95 |
| Buffalo W12 | 9.75 |
| Cleveland A7 | 9.75 |
| Donora,Pa. A7 | 9.75 |
| Duluth A7 | 9.75 |
| Johnstown,Pa. B2 | 9.75 |
| KansasCity,Mo. S5, U3 | 10.00 |
| Kokomo,Ind. C16 | 9.85 |
| LosAngeles B3 | 10.70 |
| Minnequa,Colo. C10 | 9.95 |
| Monessen,Pa. P7, P16 | 9.75 |
| NewHaven,Conn. A7 | 10.95 |
| Palmer,Mass. W12 | 10.05 |
| Pittsburg,Calif. C11 | 10.075 |
| Portsmouth,O. P12 | 9.75 |
| Roebling,N.J. R5 | 10.05 |
| S.Chicago,Ill. R2 | 9.75 |
| S.SanFrancisco C10 | 10.075 |
| SparrowsPt.,Md. B2 | 9.85 |
| Struthers,O. Y1 | 9.75 |
| Trenton,N.J. A7 | 10.05 |
| Waukegan,Ill. A7 | 9.75 |
| Worcester,Mass. A7 | 10.05 |

### WIRE, MB Spring, High-Carbon

| | |
|---|---|
| Aliquippa,Pa. J5 | 9.75 |
| Alton,Ill. L1 | 9.95 |
| Bartonville,Ill. K4 | 9.85 |
| Buffalo W12 | 9.75 |
| Cleveland A7 | 9.75 |
| Donora,Pa. A7 | 9.75 |
| Duluth A7 | 9.75 |
| Fostoria,O. S1 | 9.80 |
| Johnstown,Pa. B2 | 9.75 |
| KansasCity,Mo. S5, U3 | 10.00 |
| LosAngeles B3 | 10.20 |
| Milbury,Mass.(12) N6 | 10.05 |
| Minnequa,Colo. C10 | 9.95 |
| Monessen,Pa. P7, P16 | 9.75 |
| Muncie,Ind. I-7 | 9.95 |
| Palmer,Mass. W12 | 10.05 |
| Pittsburg,Calif. C11 | 10.20 |
| Portsmouth,O. P12 | 9.75 |
| Roebling,N.J. R5 | 10.05 |
| S.Chicago,Ill. R2 | 9.75 |
| S.SanFrancisco C10 | 10.20 |
| SparrowsPt.,Md. B2 | 9.85 |
| Struthers,O. Y1 | 9.75 |
| Trenton,N.J. A7 | 10.05 |
| Waukegan,Ill. A7 | 9.75 |
| Wor'ster,Mass.A7,J4,T6 | 10.05 |

### WIRE, Fine & Weaving(8" Coils)

| | |
|---|---|
| Alton,Ill. L1 | 16.50 |
| Bartonville,Ill. K4 | 16.40 |
| Chicago W13 | 16.30 |
| Cleveland A7 | 16.30 |
| Crawfordsville,Ind. M8 | 16.40 |
| Fostoria,O. S1 | 16.30 |
| Houston S5 | 16.55 |
| Jacksonville,Fla. M8 | 16.65 |
| Johnstown,Pa. B2 | 16.30 |
| KansasCity,Mo. S5 | 16.55 |
| Kokomo,Ind. C16 | 16.30 |
| Minnequa,Colo. C16 | 16.55 |
| Monessen,Pa. P16 | 16.30 |
| Muncie, Ind. I-7 | 16.50 |
| Palmer,Mass. W12 | 16.60 |
| S.SanFrancisco C10 | 17.15 |
| Waukegan,Ill. A7 | 16.30 |
| Worcester,Mass. A7,J6 | 16.60 |

### ROPE WIRE

| | (A) |
|---|---|
| Bartonville,Ill. K4 | 13.45 |
| Buffalo W12 | 13.45 |
| Fostoria,O. S41 | 13.45 |
| Johnstown,Pa. B2 | 13.45 |
| Monessen,Pa. P7 | 13.45 |
| Muncie,Ind. I-7 | 13.65 |
| Palmer,Mass. W12 | 13.75 |
| Portsmouth,O. P12 | 13.45 |
| Roebling,N.J. R5 | 13.75 |
| St. Louis L8 | 13.45 |
| SparrowsPt.,Md. B2 | 13.55 |
| Struthers,O. Y1 | 13.45 |
| Worcester,Mass. J4 | 13.75 |

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

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Ever-vigilant sentinels against surprise attack are the radar installations along the DEW Line. Stretching 3,000 miles across Canada and Alaska, this electronic fence is our first line of defense.

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9 billion dollars to build a better one.

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**NOW'S THE TIME TO GET GROWING IN A GROWING AMERICA**

**WIRE, Tire Bead**

| | |
|---|---|
| Bartonville, Ill. K4 | 17.15 |
| Monessen,Pa. P16 | 17.15 |
| Roebling,N.J. R5 | 17.65 |

**WIRE, Cold-Rolled Flat**

| | |
|---|---|
| Anderson,Ind. G6 | 12.35 |
| Baltimore T6 | 12.65 |
| Boston T6 | 12.65 |
| Buffalo W12 | 12.35 |
| Chicago W13 | 12.45 |
| Cleveland A7 | 12.35 |
| Crawfordsville,Ind. M8 | 12.35 |
| Dover,O. G6 | 12.35 |
| Evanston,Ill. M22 | 12.45 |
| Farrell,Pa. S3 | 12.35 |
| Fostoria,O. S1 | 12.35 |
| FranklinPark,Ill. T6 | 12.45 |
| Kokomo,Ind. C16 | 12.35 |
| Massillon,O. R8 | 12.35 |
| Milwaukee C23 | 12.55 |
| Monessen,Pa. P7, P16 | 12.35 |
| NewCastle,Pa. M23 | 12.35 |
| Palmer,Mass. W12 | 12.65 |
| Pawtucket,R.I. N8 | 12.65 |
| Philadelphia P24 | 12.65 |
| Riverdale,Ill. A1 | 12.45 |
| Rome,N.Y. R6 | 12.35 |
| Sharon,Pa. S3 | 12.35 |
| Trenton,N.J. R5 | 12.65 |
| Warren,O. B9 | 12.35 |
| Worcester,Mass. A7, T6 | 12.65 |

| NAILS, Stock Sizes | Col. |
|---|---|
| AlabamaCity,Ala. R2 | 173 |
| Aliquippa,Pa. J5 | 173 |
| Atlanta A11 | 173 |
| Bartonville,Ill. K4 | 175 |
| Chicago W13 | 173 |
| Cleveland A9 | 173 |
| Crawfordsville,Ind. M8 | 175 |
| Donora,Pa. A7 | 173 |
| Duluth A7 | 173 |
| Fairfield,Ala. T2 | 173 |
| Houston S5 | 178 |
| Jacksonville,Fla. M8 | 175 |
| Johnstown,Pa. B2 | 173 |
| Joliet,Ill. A7 | 173 |
| KansasCity,Mo. S5 | 178 |
| Kokomo,Ind. C16 | 175 |
| Minnequa,Colo. C10 | 178 |
| Monessen,Pa. P7 | 173 |
| Pittsburg,Calif. C11 | 192 |
| Rankin,Pa. A7 | 173 |
| S.Chicago,Ill. R2 | 173 |
| SparrowsPt.,Md. B2 | 175 |
| Sterling,Ill. (7) N15 | 175 |
| Worcester,Mass. A7 | 179 |

**(To Wholesalers: per cwt)**

| | |
|---|---|
| Galveston,Tex. D7 | $10.30 |

**NAILS, Cut (100 lb kegs)**

| | |
|---|---|
| Wheeling,W.Va. W10 | $10.10 |

| POLISHED STAPLES | Col. |
|---|---|
| AlabamaCity,Ala. R2 | 175 |
| Aliquippa,Pa. J5 | 173 |
| Atlanta A11 | 173 |
| Bartonville,Ill. K4 | 175 |
| Crawfordsville,Ind. M8 | 177 |
| Donora,Pa. A7 | 173 |
| Duluth A7 | 173 |
| Fairfield,Ala. T2 | 173 |
| Houston S5 | 180 |
| Jacksonville,Fla. M8 | 177 |
| Johnstown,Pa. B2 | 173 |
| Joliet,Ill. A7 | 173 |
| KansasCity,Mo. S5 | 180 |
| Kokomo,Ind. C16 | 177 |
| Minnequa,Colo. C10 | 178 |
| Pittsburg,Calif. C11 | 194 |
| Rankin,Pa. A7 | 173 |
| S.Chicago,Ill. R2 | 175 |
| SparrowsPt.,Md. B2 | 175 |
| Sterling,Ill.(7) N15 | 175 |
| Worcester,Mass. A7 | 179 |

**TIE WIRE, Automatic Baler (14½ Ga.) (per 97 lb net box)**
**Coil No. 3150**

| | |
|---|---|
| AlabamaCity,Ala. R2 | $8.78 |
| Atlanta A11 | 10.36 |
| Bartonville,Ill. K4 | 8.88 |
| Buffalo W12 | 10.26 |
| Chicago W13 | 9.24 |
| Crawfordsville,Ind. M8 | 8.88 |
| Donora,Pa. A7 | 8.78 |
| Duluth A7 | 8.78 |
| Fairfield,Ala. T2 | 8.78 |
| Houston S5 | 9.02 |
| Jacksonville,Fla. M8 | 8.88 |
| Johnstown,Pa. B2 | 8.78 |
| Joliet,Ill. A7 | 8.78 |
| KansasCity,Mo. S5 | 9.02 |
| Kokomo,Ind. C16 | 8.88 |
| LosAngeles B3 | 9.20 |
| Minnequa,Colo. C10 | 8.02 |
| Pittsburg,Calif. C11 | 9.20 |
| S.Chicago,Ill. R2 | 8.78 |
| S.SanFrancisco C10 | 9.20 |
| SparrowsPt.,Md. B2 | 8.88 |
| Sterling,Ill.(37) N15 | 8.88 |

**Coil No. 6500 Stand.**
**100 lb coil**

| | |
|---|---|
| AlabamaCity,Ala. R2 | $9.06 |
| Atlanta A11 | 10.70 |
| Bartonville,Ill. K4 | 9.16 |
| Buffalo W12 | 10.60 |
| Chicago W13 | 9.54 |
| Crawfordsville,Ind. M8 | 9.16 |
| Donora,Pa. A7 | 9.06 |
| Duluth A7 | 9.06 |
| Fairfield,Ala. T2 | 9.06 |
| Houston S5 | 9.30 |
| Jacksonville,Fla. M8 | 9.16 |
| Johnstown,Pa. B2 | 9.06 |
| Joliet,Ill. A7 | 9.06 |
| KansasCity,Mo. S5 | 9.30 |
| Kokomo,Ind. C16 | 9.16 |
| LosAngeles B3 | 9.50 |
| Minnequa,Colo. C10 | 9.30 |
| Pittsburg,Calif. C11 | 9.50 |
| S.Chicago,Ill. R2 | 9.06 |
| S.SanFrancisco C10 | 9.50 |
| SparrowsPt.,Md. B2 | 9.16 |
| Sterling,Ill.(37) N15 | 9.16 |

**Coil No. 6500 Interim**
**100 lb coil**

| | |
|---|---|
| AlabamaCity,Ala. R2 | $9.11 |
| Atlanta A11 | 10.75 |
| Bartonville,Ill. K4 | 9.21 |
| Buffalo W12 | 10.65 |
| Chicago W13 | 9.59 |
| Crawfordsville,Ind. M8 | 9.21 |
| Donora,Pa. A7 | 9.11 |
| Duluth A7 | 9.11 |
| Fairfield,Ala. T2 | 9.11 |
| Houston S5 | 9.35 |
| Jacksonville,Fla. M8 | 9.21 |
| Johnstown,Pa. B2 | 9.11 |
| Joliet,Ill. A7 | 9.11 |
| KansasCity,Mo. S5 | 9.35 |
| Kokomo,Ind. C16 | 9.21 |
| LosAngeles B3 | 9.55 |
| Minnequa,Colo. C10 | 9.35 |
| Pittsburg,Calif. C11 | 9.55 |
| S.Chicago,Ill. R2 | 9.11 |
| S.SanFrancisco C10 | 9.55 |
| SparrowsPt.,Md. B2 | 9.21 |
| Sterling,Ill.(37) N15 | 9.21 |

| BALE TIES, Single Loop | Col. |
|---|---|
| AlabamaCity,Ala. R2 | 212 |
| Atlanta A11 | 212 |
| Bartonville,Ill. K4 | 214 |
| Crawfordsville,Ind. M8 | 214 |
| Donora,Pa. A7 | 212 |
| Duluth A7 | 212 |
| Fairfield,Ala. T2 | 212 |
| Houston S5 | 217 |
| Jacksonville,Fla. M8 | 214 |
| Joliet,Ill. A7 | 212 |
| KansasCity,Mo. S5 | 217 |
| Kokomo,Ind. C16 | 214 |
| Minnequa,Colo. C10 | 217 |
| SparrowsPt.,Md. B2 | 214 |
| Sterling,Ill.(7) N15 | 214 |

| WIRE, Barbed | Col. |
|---|---|
| AlabamaCity,Ala. R2 | 193** |
| Aliquippa,Pa. J5 | 190§ |
| Atlanta A11 | 197* |
| Bartonville,Ill. K4 | 199 |
| Crawfordsville,Ind. M8 | 198 |
| Donora,Pa. A7 | 193† |
| Duluth A7 | 193† |
| Fairfield,Ala. T2 | 193† |
| Houston S5 | 198** |
| Jacksonville,Fla. M8 | 198 |
| Johnstown,Pa. B2 | 196§ |
| Joliet,Ill. A7 | 193† |
| KansasCity,Mo. S5 | 198** |
| Kokomo,Ind. C16 | 195† |
| Minnequa,Colo. C10 | 198** |
| Monessen,Pa. P7 | 196§ |
| Pittsburg,Calif. C11 | 213† |
| Rankin,Pa. A7 | 193† |
| S.Chicago,Ill. R2 | 193** |
| SparrowsPoint,Md. B2 | 198§ |
| Sterling,Ill.(7) N15 | 198 |

| WIRE (16 gage | An'ld Stone | Galv. Stone |
|---|---|---|
| Ala.City,Ala.R2 | 17.85 | 19.40** |
| Aliq'ppa,Pa. J5 | 17.85 | 19.65 |
| Bartonville K4 | 17.95 | 19.80 |
| Chicago W13 | 17.85 | .... |
| Cleveland A7 | 17.85 | .... |
| Craw'sville M8 | 17.95 | 19.80‡‡ |
| Fostoria,O. S1 | 18.35 | 19.90† |
| Houston S5 | 18.10 | 19.65** |
| Jacksonville M8 | 17.95 | 19.80‡‡ |
| Johnstown B2 | 17.85 | 19.65§ |
| Kan.City,Mo. S5 | 18.10 | .... |
| Kokomo C16 | 17.95 | 19.50† |
| Minnequa C10 | 18.10 | 19.65** |
| P'lm'r,Mass.W12 | 19.10 | 19.70† |
| Pitts.,Calif. C11 | 18.20 | 19.75† |
| S.SanFran. C10 | 18.20 | 19.75** |
| SparrowsPt. B2 | 17.95 | 19.75§ |
| St'ling(37) N15 | 17.95 | 19.80 |
| Waukegan A7 | 17.85 | 19.40† |
| Worcester A7 | 18.15 | .... |

| FENCE POSTS | Col. |
|---|---|
| Birmingham C15 | 177 |
| ChicagoHts.,Ill. C2, I-2 | 177 |
| Duluth A7 | 177 |
| Franklin,Pa. F5 | 177 |
| Johnstown,Pa. B2 | 177 |
| Marion,O. P11 | 177 |
| Minnequa,Colo. C10 | 182 |
| Tonawanda,N.Y. B12 | 177 |

| WOVEN FENCE, 9-15 Ga. | Col. |
|---|---|
| Ala.City,Ala. R2 | 187** |
| Aliq'ppa,Pa.9-11½Ga.J5 | 190§ |
| Atlanta A11 | 191* |
| Bartonville,Ill. K4 | 193 |
| Crawfordsville,Ind. M8 | 192 |
| Donora,Pa. A7 | 187† |
| Duluth A7 | 187† |
| Fairfield,Ala. T2 | 187† |
| Houston S5 | 192** |
| Jacksonville,Fla. M8 | 192 |
| Johnstown,Pa.(42) B2 | 190§ |
| Joliet,Ill. A7 | 187† |
| KansasCity,Mo. S5 | 192** |
| Kokomo,Ind. C16 | 189† |
| Minnequa,Colo. C10 | 192** |
| Pittsburg,Calif. C11 | 210† |
| Rankin,Pa. A1 | 187† |
| S.Chicago,Ill. R2 | 187** |
| Sterling,Ill.(7) N15 | 192 |

| WIRE, Merchant Quality 6 to 8 gage | An'ld | Galv. |
|---|---|---|
| Ala.City,Ala. R2 | 9.00 | 9.55** |
| Aliquippa J5 | 8.65 | 9.325§ |
| Atlanta(48) A11 | 9.00 | 9.75* |
| Bartonville(48) K4 | 9.10 | 9.85 |
| Buffalo W12 | 9.00 | 9.55† |
| Chicago W13 | 9.00 | 9.55** |
| Cleveland A7 | 9.00 | .... |
| CrawfordsvilleM8 | 9.10 | 9.80†† |
| Donora,Pa. A7 | 9.00 | 9.55† |
| Duluth A7 | 9.00 | 9.55† |
| Fairfield T2 | 9.00 | 9.55 |
| Houston(48) S5 | 9.25 | 9.80** |
| Jack'vill,Fla. M8 | 9.10 | 9.80‡‡ |
| Johnstown(48) B2 | 9.00 | 9.675§ |
| Joliet,Ill. A7 | 9.00 | 9.55† |
| KansasCity(48)S5 | 9.25 | 9.80** |
| Kokomo(48) S16 | 9.10 | 9.65† |
| LosAngeles B3 | 9.95 | 10.625§ |
| Minnequa C10 | 9.25 | 9.80** |
| Monessen(48) P7 | 8.65 | 9.35§ |
| Palmer,Mass. W12 | 9.30 | 9.85† |
| Pitts.,Calif. C11 | 9.95 | 10.50† |
| Rankin,Pa. A7 | 9.00 | 9.55† |
| S.Chicago R2 | 9.00 | 9.55** |
| S.SanFran. C10 | 9.95 | 10.50** |
| Spar'wsPt.(48)B2 | 9.10 | 9.775§ |
| St'ling(37)(48)N15 | 9.10 | 9.80 |
| Struthers,O. Y1 | '9.00 | 9.65‡ |
| Worcester,Mass.A7 | 9.30 | 9.85† |

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Based on zinc prices of: *13.50c. †5c. §10c. ‡Less than 10c. ††10.50c. ‡‡11.10c. **Subject to zinc equalization extras.

## FASTENERS

**SCREWS, NUTS, BOLTS**

(Consumer discounts per cent off list prices, plain finishes. For less than full container quantities, add 25 per cent; attaching nuts to bolts in sizes ¼ in. through ⅝ in. diameter through 8 in. in length, price on application. Discounts are determined by the quantity of screws, nuts, and bolts ordered for one destination at one time.)

| | |
|---|---|
| Base, one keg | 43.00 |
| 20,000 lb or more | 53.00 |

**SCREWS, SETSCREWS**

Hex Screws and High Strength Hex Screws, through 1 in. x 12 in.:

| | |
|---|---|
| Base, one keg | 43.00 |
| 20,000 lb or more | 53.00 |

Hex Screws 1⅛ in. diameter and larger: See net price schedule.

Fillister Head Screws, coarse thread:

| | |
|---|---|
| Packages | +70.00 |
| Bulk | +28.00 |

Flat Head Screws, coarse thread:

| | |
|---|---|
| Packages | +100.00 |
| Bulk | +52.00 |

Setscrews, Square Head, Cup-point, coarse thread:

| | |
|---|---|
| Packages | +10.00 |
| Bulk | 15.00 |

(Bulk discounts on fillister, flat head, and set screws apply only to products ordered in these minimum quantities: ¼ in. through ⅜ in. diameter, 15,000 pieces; 7/16 in. through ⅝ in. diameter, 5000 pieces; and ¾ in. through 1 in. diameter, 2000 pieces.)

**RIVETS**

F.o.b. Cleveland and/or freight equalized with Pittsburg, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.

Structural ½ in. larger 12.85 7/16 in. and smaller by 6 in. and shorter, 15% off list.

## PRESTRESSED STRAND

(High strength, stress relieved; 7 wire uncoated. Net prices per 1000 ft, 40,000 lb and over.)

| | Standard Diameter, Inches | | | | |
|---|---|---|---|---|---|
| | 1/4 | 5/16 | 3/8 | 7/16 | 1/2 |
| Buffalo W12 | $26.20 | $38.50 | $47.90 | $61.30 | $80.30 |
| KansasCity,Mo. U3 | 26.20 | 38.50 | 47.90 | 61.30 | 80.30 |
| Minnequa,Colo. C10 | 26.20 | 38.50 | 47.90 | 61.30 | 80.30 |
| Pittsburg,Calif. C11 | 26.20 | 38.50 | 47.90 | 61.30 | 80.30 |
| Roebling,N.J. R5 | 26.20 | 38.50 | 47.90 | 61.30 | 80.30 |
| SparrowsPoint,Md. B2 | 26.20 | 38.50 | 47.90 | 61.30 | 80.30 |
| St.Louis L8 | 26.20 | 38.50 | 47.90 | 61.30 | 80.30 |
| Waukegan,Ill. A7 | 26.20 | 38.50 | 47.90 | 61.30 | 80.30 |

## BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut length 10 to 24 ft, inclusive.

| O.D. In. | B.W. Gage | Seamless H.R. | Seamless C.D. | Elec. Weld H.R. |
|---|---|---|---|---|
| 1 | 13 | .... | 27.24 | 23.12 |
| 1¼ | 13 | .... | 32.25 | 24.41 |
| 1½ | 13 | 30.42 | 35.65 | 26.98 |
| 1¾ | 13 | 35.94 | 42.12 | 31.89 |
| 2 | 13 | 40.28 | 47.21 | 35.74 |
| 2¼ | 13 | 45.36 | 58.17 | 40.26 |
| 2¼ | 12 | 49.24 | 57.72 | 43.70 |
| 2½ | 12 | 54.23 | 63.57 | 48.13 |
| 2¾ | 12 | 58.73 | 68.83 | 52.13 |
| 3 | 12 | 62.62 | 73.40 | 55.59 |

## RAILWAY MATERIALS

| | Standard | | | Tee Rails 60 lb |
|---|---|---|---|---|
| Rails | No. 1 | No. 2 | All No. 2 | Under |
| Bessemer,Pa. U5 | 5.75 | 5.65 | .... | 6.725 |
| Ensley,Ala. T2 | 5.75 | 5.65 | .... | 6.725 |
| Fairfield,Ala. T2 | .... | .... | .... | 6.725 |
| Gary,Ind. U5 | 5.75 | 5.65 | .... | .... |
| Huntington,W.Va. C15 | .... | .... | .... | 6.725 |
| Johnstown,Pa. B2 | .... | .... | .... | (16)6.725 |
| Lackawanna,N.Y. B2 | 5.75 | 5.65 | .... | 6.725 |
| Minnequa,Colo. C10 | 5.75 | 5.65 | .... | 7.725 |
| Steelton,Pa. B2 | 5.75 | 5.65 | .... | .... |

**TIE PLATES**

| | |
|---|---|
| Fairfield,Ala. T2 | 6.875 |
| Gary,Ind. U5 | 6.875 |
| Lackawanna,N.Y. B2 | 6.875 |
| Minnequa,Colo. C10 | 6.875 |
| Seattle B3 | 7.025 |
| Steelton,Pa. B2 | 6.875 |
| Torrance,Calif. C11 | 7.025 |

**JOINT BARS**

| | |
|---|---|
| Bessemer,Pa. U5 | 7.25 |
| Fairfield,Ala. T2 | 7.25 |
| Joliet,Ill. U5 | 7.25 |
| Lackawanna,N.Y. B2 | 7.25 |
| Minnequa,Colo. C10 | 7.25 |
| Steelton,Pa. B2 | 7.25 |

**AXLES**

| | |
|---|---|
| Ind.Harbor,Ind. S13 | 9.125 |
| Johnstown,Pa. B2 | 9.125 |

**SCREW SPIKES**

| | |
|---|---|
| Lebanon,Pa. B2 | 15.10 |

**TRACK BOLTS, Untreated**

| | |
|---|---|
| Cleveland R2 | 15.35 |
| KansasCity,Mo. S5 | 15.35 |
| Lebanon,Pa. B2 | 15.35 |
| Minnequa,Colo. C10 | 15.35 |
| Pittsbugh S44 | 15.35 |
| Seattle B3 | 15.85 |

**STANDARD TRACK SPIKES**

| | |
|---|---|
| Fairfield,Ala. T2 | 10.10 |
| Ind.Harbor,Ind, I-2, Y1 | 10.10 |
| KansasCity,Mo. S5 | 10.10 |
| Lebanon,Pa. B2 | 10.10 |
| Minnequa,Colo. C10 | 10.10 |
| Pittsburgh J5 | 10.10 |
| Seattle B3 | 10.60 |
| S.Chicago, Ill. R2 | 10.10 |
| Struthers,O. Y1 | 10.10 |
| Youngstown R2 | 10.10 |

## FOOTNOTES

(1) Chicago base.
(2) Double galvanized.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Limited analyses only.
(7) Chicago base 2 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Bethany A coating.
(12) Worcester, Mass., base.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(23) Special quality.
(24) Deduct 0.05c, finer than 15 Ga.
(25) Bar mill bands.
(27) Bar mill sizes.
(28) Bonderized.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 7.375c, for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) 14 Ga., 48 in.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38 13 Ga. & lighter 60" & narrower.
(39) 48" and narrower.
(43) 9-14½ Ga.
(44) To fabricators.
(48) 6-7 Ga.
(49) 3⅛ in. and smaller rounds and 2⅛ in. and smaller hexagons; 9.625c for larger rounds and hexagons and other shapes.

### SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

| Size—Inches | 2 | | 2½ | | 3 | | 3½ | | 4 | | 5 | | 6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| List Per Ft | 37c | | 58.5c | | 76.5c | | 92c | | $1.09 | | $1.48 | | $1.92 | |
| Pounds Per Ft | 3.68 | | 5.82 | | 7.62 | | 9.20 | | 10.89 | | 14.81 | | 19.18 | |
| | Blk | Galv* | Blk | Galv* | Blk | Galv* | Blk | Galv* | Blk | Galv* | Blk | Galv* | Blk | Galv* |
| Aliquippa, Pa. J5 | +12.25 | +28.75 | +5.75 | +23.5 | +3.25 | +21 | +1.75 | +19.5 | +1.75 | +19.5 | +2 | +19.75 | 0.5 | +17.25 |
| Ambridge, Pa. N2 | +12.25 | .... | +5.75 | .... | +3.25 | .... | +1.75 | .... | +1.75 | .... | +2 | .... | 0.5 | .... |
| Lorain, O. N3 | +12.25 | +28.75 | +5.75 | +23.5 | +3.25 | +21 | +1.75 | +19.5 | +1.75 | +19.5 | +2 | +19.75 | 0.5 | +17.25 |
| Youngstown Y1 | +12.25 | +28.75 | +5.75 | +23.5 | +3.25 | +21 | +1.75 | +19.5 | +1.75 | +19.5 | +2 | +19.75 | 0.5 | +17.25 |

### ELECTRICWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Youngstown R2 | +12.25 | +28.75 | +5.75 | +23.5 | +3.25 | +21 | +1.75 | +19.5 | +1.75 | +19.5 | +2 | +19.75 | 0.5 | +17.25 |

### BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

| Size—Inches | ⅛ | | ¼ | | ⅜ | | ½ | | ¾ | | 1 | | 1¼ | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| List Per Ft | 5.5c | | 6c | | 6c | | 8.5c | | 11.5c | | 17c | | 23c | |
| Pounds Per Ft | 0.24 | | 0.42 | | 0.57 | | 0.85 | | 1.13 | | 1.68 | | 2.28 | |
| | Blk | Galv* | Blk | Galv* | Blk | Galv* | Blk | Galv* | Blk | Galv* | Blk | Galv* | Blk | Galv* |
| Aliquippa, Pa. J5 | .... | .... | .... | .... | .... | .... | 2.25 | +15 | 5.25 | +11 | 8.75 | +6.5 | 11.25 | +5.25 |
| Alton, Ill. L1 | .... | .... | .... | .... | .... | .... | 0.25 | +17 | 3.25 | +13 | 6.75 | +8.5 | 9.25 | +7.25 |
| Benwood, W. Va. W10 | .... | .... | .... | .... | .... | .... | 2.25 | +15 | 5.25 | +11 | 8.75 | +6.5 | 11.25 | +5.25 |
| Butler, Pa. F6 | 4.5 | +24 | +8.5 | +34 | +19.5 | +44 | .... | .... | .... | .... | .... | .... | .... | .... |
| Etna, Pa. N2 | .... | .... | .... | .... | .... | .... | 2.25 | +15 | 5.25 | +11 | 8.75 | +6.5 | 11.25 | +5.25 |
| Fairless, Pa. N3 | .... | .... | .... | .... | .... | .... | 0.25 | +17 | 3.25 | +13 | 6.75 | +8.5 | 9.25 | +7.25 |
| Fontana, Calif. K1 | .... | .... | .... | .... | .... | .... | +10.75 | +28 | +7.75 | +24 | +4.25 | +19.5 | +1.75 | +18.25 |
| Indiana Harbor, Ind. Y1 | .... | .... | .... | .... | .... | .... | 1.25 | +16 | 4.25 | +12 | 7.75 | +7.5 | 10.25 | +6.25 |
| Lorain, O. N3 | .... | .... | .... | .... | .... | .... | 2.25 | +15 | 5.25 | +11 | 8.75 | +6.5 | 11.25 | +5.25 |
| Sharon, Pa. S4 | 4.5 | +24 | +8.5 | +34 | +19.5 | +44 | .... | .... | .... | .... | .... | .... | .... | .... |
| Sharon, Pa. M6 | .... | .... | .... | .... | .... | .... | 2.25 | +15 | 5.25 | +11 | 8.75 | +6.5 | 11.25 | +5.25 |
| Sparrows Pt., Md. B2 | 2.5 | +26 | +10.5 | +36 | +21.5 | +46 | 0.25 | +17 | 3.25 | +13 | 6.75 | +8.5 | 9.25 | +7.25 |
| Wheatland, Pa. W9 | 4.5 | +24 | +8.5 | +34 | +19.5 | +44 | 2.25 | +15 | 5.25 | +11 | 8.75 | +6.5 | 11.25 | +5.25 |
| Youngstown R2, Y1 | .... | .... | .... | .... | .... | .... | 2.25 | +15 | 5.25 | +11 | 8.75 | +6.5 | 11.25 | +5.25 |

| Size—Inches | 1½ | | 2 | | 2½ | | 3 | | 3½ | | 4 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| List Per Ft | 27.5c | | 37c | | 58.5c | | 76.5c | | 92c | | $1.09 | |
| Pounds Per Ft | 2.75 | | 3.68 | | 5.82 | | 7.62 | | 9.20 | | 10.89 | |
| | Blk | Galv* | Blk | Galv* | Blk | Galv* | Blk | Galv* | Blk | Galv* | Blk | Galv* |
| Aliquippa, Pa. J5 | 11.75 | +4.25 | 12.25 | +3.75 | 13.75 | +3.5 | 13.75 | +3.5 | 3.25 | +14.5 | 3.25 | +14.5 |
| Alton, Ill. L1 | 9.75 | +6.25 | 10.25 | +5.75 | 11.75 | +5.5 | 11.75 | +5.5 | 1.25 | +16.5 | 1.25 | +16.5 |
| Benwood, W. Va. W10 | 11.75 | +4.25 | 12.25 | +3.75 | 13.75 | +3.5 | 13.75 | +3.5 | 3.25 | +14.5 | 3.25 | +14.5 |
| Etna, Pa. N2 | 11.75 | +4.25 | 12.25 | +3.75 | 13.75 | +3.5 | 13.75 | +3.5 | 3.25 | +14.5 | 3.25 | +14.5 |
| Fairless, Pa. N3 | 9.75 | +6.25 | 10.25 | +5.25 | 11.75 | +5.5 | 11.75 | +5.5 | 1.25 | +16.5 | 1.25 | +16.5 |
| Fontana, Calif. K1 | +1.25 | +17.25 | +0.75 | +16.75 | 0.75 | +16.5 | 0.75 | +16.5 | +9.75 | +27.5 | +9.75 | +27.5 |
| Indiana Harbor, Ind. Y1 | 10.75 | +5.25 | 11.25 | +4.75 | 12.75 | +4.5 | 12.75 | +4.5 | 2.25 | +15.5 | 2.25 | +15.5 |
| Lorain, O. N3 | 11.75 | +4.25 | 12.25 | +3.75 | 13.75 | +3.5 | 13.75 | +3.5 | .... | .... | .... | .... |
| Sharon, Pa. M6 | 11.75 | +4.25 | 12.25 | +3.75 | 13.75 | +3.5 | 13.75 | +3.5 | 3.25 | +14.5 | 3.25 | +14.5 |
| Sparrows Pt., Md. B2 | 9.75 | +6.25 | 10.25 | +5.75 | 11.75 | +5.5 | 11.75 | +5.5 | 1.25 | +16.5 | 1.25 | +16.5 |
| Wheatland, Pa. W9 | 11.75 | +4.25 | 12.25 | +3.75 | 13.75 | +3.5 | 13.75 | +3.5 | 3.25 | +14.5 | 3.25 | +14.5 |
| Youngstown R2, Y1 | 11.75 | +4.25 | 12.25 | +3.75 | 13.75 | +3.5 | 13.75 | +3.5 | 3.25 | +14.5 | 3.25 | +14.5 |

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*Galvanized pipe discounts based on price of zinc at 11.50c, East St. Louis.

## Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

| AISI Type | —Rerolling— Ingot | Slabs | Forging Billets | H.R. Strip | H.R. Rods; C.F. Wire | Bars; Structural Shapes | Plates | Sheets | C.R. Strip; Flat Wire |
|---|---|---|---|---|---|---|---|---|---|
| 201 | 22.75 | 25.00 | .... | 36.00 | 41.50 | 43.50 | 39.25 | 48.50 | 43.50 |
| 202 | 24.75 | 28.25 | 37.75 | 39.00 | 42.25 | 44.50 | 40.00 | 49.25 | 46.75 |
| 301 | 24.00 | 26.00 | 38.75 | 37.25 | 43.50 | 46.00 | 41.25 | 51.25 | 45.00 |
| 302 | 26.25 | 29.50 | 39.50 | 40.50 | 44.25 | 46.75 | 42.25 | 52.00 | 49.50 |
| 302B | 26.50 | 30.75 | 42.25 | 45.75 | 46.75 | 49.00 | 44.50 | 57.00 | 57.00 |
| 303 | .... | 33.25 | 42.50 | .... | 47.25 | 49.75 | 45.00 | 56.75 | 56.75 |
| 304 | 28.00 | 29.50 | 39.50 | 40.50 | 44.25 | 46.75 | 42.25 | 52.00 | 49.50 |
| 304L | .... | 37.25 | 47.25 | 48.25 | 52.00 | 54.50 | 50.00 | 59.75 | 57.25 |
| 305 | 29.50 | 34.75 | 44.00 | 47.50 | 47.00 | 49.50 | 46.25 | 58.75 | 58.75 |
| 308 | 32.00 | 36.25 | 49.00 | 50.25 | 54.75 | 57.75 | 55.25 | 63.00 | 63.00 |
| 309 | 41.25 | 47.50 | 60.00 | 64.50 | 66.25 | 69.50 | 66.00 | 80.50 | 80.50 |
| 310 | 51.50 | 59.50 | 81.00 | 84.25 | 89.75 | 94.50 | 87.75 | 96.75 | 96.75 |
| 314 | .... | .... | 80.50 | .... | 89.75 | 94.50 | 87.75 | .... | 104.25 |
| 316 | 41.25 | 47.50 | 64.50 | 68.50 | 71.75 | 75.75 | 71.75 | 80.75 | 76.75 |
| 316L | .... | 55.25 | 72.25 | 76.25 | 79.50 | 83.50 | 79.50 | 88.50 | 84.50 |
| 317 | 49.75 | 58.00 | 79.75 | 88.25 | 89.50 | 94.25 | 88.50 | 101.00 | 101.00 |
| 321 | 33.50 | 38.00 | 48.75 | 53.50 | 54.50 | 57.50 | 54.75 | 65.50 | 62.25 |
| 330 | .... | .... | 123.25 | .... | 98.75 | 143.75 | 135.00 | 149.25 | 149.25 |
| 18-8 Cb-Ta | 38.50 | 48.25 | 57.75 | 63.50 | 63.75 | 67.25 | 64.75 | 79.25 | 75.25 |
| 403 | .... | .... | 26.75 | .... | 29.75 | 31.50 | 30.00 | 40.25 | 40.25 |
| 405 | 20.25 | 26.50 | 30.75 | 36.00 | 34.75 | 36.50 | 32.50 | 46.75 | 46.75 |
| 410 | 17.50 | 19.50 | 26.75 | 31.00 | 29.75 | 31.50 | 30.00 | 40.25 | 40.25 |
| 416 | .... | .... | 29.75 | .... | 33.75 | 35.50 | 31.25 | 48.25 | 48.25 |
| 420 | .... | 31.50 | 35.50 | 41.75 | 40.75 | 42.75 | 40.25 | 62.00 | 62.00 |
| 430 | 17.75 | 19.75 | 29.75 | 32.00 | 33.75 | 35.50 | 31.00 | 40.75 | 38.75 |
| 430F | .... | .... | 30.50 | .... | 34.25 | 36.00 | 31.75 | 51.75 | 42.00 |
| 431 | .... | 29.75 | 39.25 | .... | 43.50 | 46.00 | 41.00 | 56.00 | 56.00 |
| 446 | .... | .... | 40.75 | 59.00 | 46.00 | 48.25 | 42.75 | 70.00 | 70.00 |

**Producers Are:** Allegheny Ludlum Steel Corp.; American Steel & Wire Div., U. S. Steel Corp.; Anchor Drawn Steel Co., division of Vanadium-Alloys Steel Co.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; A. M. Byers Co.; Calstrip Steel Corp.; G. O. Carlson Inc.; Carpenter Steel Co.; Carpenter Steel Co. of New England; Charter Wire Products; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Firth Sterling Inc.; Fort Wayne Metals Inc.; Green River Steel Corp., subsidiary of Jessop Steel Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Elwood Ivins Steel Tube Works Inc.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Stainless & Strip Div., Jones & Laughlin Steel Corp.; Joslyn Stainless Steels, division of Joslyn Mfg. & Supply Co.; Latrobe Steel Co.; Lukens Steel Co.; Maryland Fine & Specialty Wire Co. Inc.; McLouth Steel Corp.; Metal Forming Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Phoenix Steel Corp.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Riverside-Alloy Metal Div., H. K. Porter Company Inc.; Rodney Metals Inc.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Somers Brass Co.; Specialty Wire Co. Inc.; Standard Tube Co.; Superior Steel Div., Copperweld Steel Co.; Superior Tube Co.; Swepco Tube Corp.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co., subsidiary of Crucible Steel Co. of America; Tube Methods Inc.; Ulbrich Stainless Steels, Inc.; Union Steel Corp.; U. S. Steel Corp.; Universal Cyclops Corp.; Vanadium-Alloy Steel Co., Wall Tube & Metal Products Co.; Wallingford Steel, subsidiary of Allegheny Ludlum Steel Corp.; Washington Steel Corp.; Seymour Mfg. Co.

## Clad Steel

| | —Plates— Carbon Base 5% | 10% | 15% | 20% | Sheets Carbon Base 20% |
|---|---|---|---|---|---|
| Stainless | | | | | |
| 302 | .... | .... | .... | .... | 37.50 |
| 304 | 26.05 | 28.80 | 31.55 | 34.30 | 39.75 |
| 304L | 30.50 | 33.75 | 36.95 | 40.15 | .... |
| 316 | 38.20 | 42.20 | 46.25 | 50.25 | 58.25 |
| 316L | 42.30 | 46.75 | 51.20 | 55.65 | .... |
| 316 Cb | 49.90 | 55.15 | 60.40 | 65.65 | .... |
| 321 | 31.20 | 34.50 | 37.75 | 41.05 | 47.25 |
| 347 | 36.90 | 40.80 | 44.65 | 48.55 | 57.00 |
| 405 | 22.25 | 24.60 | 26.90 | 29.25 | .... |
| 410 | 20.55 | 22.70 | 24.85 | 27.00 | .... |
| 430 | 21.20 | 23.45 | 25.65 | 27.90 | .... |
| Inconel | 49.80 | 61.35 | 72.80 | 84.40 | .... |
| Nickel | 43.20 | 55.05 | 66.95 | 78.90 | .... |
| Nickel, Low Carbon | 43.50 | 55.70 | 67.95 | 80.35 | .... |
| Monel | 44.25 | 55.35 | 66.45 | 77.60 | .... |

| | Strip, Carbon Base —Cold Rolled— 10% | Both Sides |
|---|---|---|
| Copper* | 36.10 | 43.00 |

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*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. P4; Coatesville, Pa. L7; New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Claymont, Del. P4; Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

## Tool Steel

| Grade | $ per lb | Grade | $ per lb |
|---|---|---|---|
| Reg. Carbon (W-1) | 0.330 | Hi-Carbon-Cr (D-11) | 0.955 |
| Spec. Carbon (W-1) | 0.385 | V-Cr Hot Work (H-13) | 0.550 |
| Oil Hardening (O-1) | 0.505 | W-Cr Hot Work (H-12) | 0.530 |
| V-Cr Hot Work (H-11) | 0.505 | W Hot Wk (H-21) | 1.425-1.44 |

| — Grade by Analysis (%) — W | Cr | V | Co | Mo | AISI Designation | $ per lb |
|---|---|---|---|---|---|---|
| 18 | 4 | 1 | .... | ... | T-1 | 1.840 |
| 18 | 4 | 2 | .... | ... | T-2 | 2.005 |
| 13.5 | 4 | 3 | .... | ... | T-3 | 2.105 |
| 18.25 | 4.25 | 1 | 4.75 | ... | T-4 | 2.545 |
| 18 | 4 | 2 | 9 | ... | T-5 | 2.915 |
| 20.25 | 4.25 | 1.6 | 12.95 | ... | T-6 | 4.330 |
| 13.75 | 3.75 | 2 | 5 | ... | T-8 | 2.485 |
| 1.5 | 4 | 1 | .... | 8.5 | M-1 | 1.200 |
| 6.4 | 4.5 | 1.9 | .... | 5 | M-2 | 1.345 |
| 6 | 4 | 3 | .... | 6 | M-3 | 1.590 |

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

# Pig Iron

Prices in dollars per gross ton, f.o.b. (rail) furnace; add 50 cents when shipped by truck. Maximum delivered prices are approximate and based on rail shipment.

| | Basic | No. 2 Foundry | Malleable | Bessemer |
|---|---|---|---|---|
| *Birmingham District* | | | | |
| Birmingham R2 | 62.00 | 62.50** | 66.50 | .... |
| Birmingham U6 | .... | 62.50** | 66.50 | .... |
| Woodward, Ala. W15 | 62.00* | 62.50** | 66.50 | .... |
| Cincinnati, deld. | .... | 70.20 | .... | .... |
| *Buffalo District* | | | | |
| Buffalo H1, R2 | 66.00 | 66.50 | 67.00 | 67.50 |
| NorthTonawanda, N.Y. T9 | .... | 66.50 | 67.00 | 67.50 |
| Tonawanda, N.Y. W12 | 66.00 | 66.50 | 67.00 | 67.50 |
| Boston, deld. | 77.29 | 77.79 | 78.29 | .... |
| Rochester, N.Y., deld. | 69.02 | 69.52 | 70.02 | .... |
| Syracuse, N.Y., deld. | 70.12 | 70.62 | 71.12 | .... |
| *Chicago District* | | | | |
| Chicago I-3 | 66.00 | 66.50 | 66.50 | 67.00 |
| SouthChicago, Ill. R2 | 66.00 | 66.50 | 66.50 | 67.00 |
| SouthChicago, Ill. W14 | 66.00 | .... | 66.50 | 67.00 |
| Milwaukee, deld. | 68.81 | 69.31 | 69.31 | 69.81 |
| Muskegon, Mich., deld. | .... | 74.46 | 74.46 | .... |
| *Cleveland District* | | | | |
| Cleveland R2, A7 | 66.00 | 66.50 | 66.50 | 67.00 |
| Akron, Ohio, deld. | 69.52 | 70.02 | 70.02 | 70.52 |
| *Mid-Atlantic District* | | | | |
| Birdsboro, Pa. B10 | 68.00 | 68.50 | 69.00 | 69.50 |
| Chester, Pa. P4 | Nom. | Nom. | Nom. | .... |
| Swedeland, Pa. A3 | 68.00 | 68.50 | 69.00 | 69.50 |
| NewYork, deld. | .... | 75.41 | 75.91 | .... |
| Newark, N.J., deld. | 72.53 | 73.03 | 73.53 | 74.03 |
| Philadelphia, deld. | 70.18 | 70.68 | 71.18 | 71.68 |
| Troy, N.Y. R2 | 68.00 | 68.50 | 69.00 | 69.50 |
| Boston, deld. | 75.20 | 75.70 | 76.20 | 76.70 |
| *Pittsburgh District* | | | | |
| NevilleIsland, Pa. P6 | 66.00 | 66.50 | 66.50 | 67.00 |
| Pittsburgh (N&S sides), deld. | .... | 68.31 | 68.31 | 68.81 |
| Monaca, Pa., deld. | .... | 68.33 | 68.33 | 68.83 |
| Lawrenceville, W. Homestead, Wilmerding, Pa., deld. | .... | 68.68 | 68.68 | 69.18 |
| Verona, Trafford, Pa., deld. | 68.83 | 69.33 | 69.33 | 69.83 |
| Brackenridge, Pa., deld. | 69.16 | 69.66 | 69.66 | 70.16 |
| Midland, Pa. C18 | 66.00 | .... | .... | .... |
| *Youngstown District* | | | | |
| Hubbard, Ohio Y1 | .... | .... | 66.50 | .... |
| Sharpsville, Pa. S6 | 66.00 | .... | 66.50 | 67.00 |
| Youngstown Y1 | .... | .... | 66.50 | .... |
| *Other U. S. Districts* | | | | |
| Duluth I-3 | 66.00 | 66.50 | 66.50 | 67.00 |
| Erie, Pa. I-3 | 66.00 | 66.50 | 66.50 | 67.00 |
| Fontana, Calif. K1 | 75.00 | 75.50 | .... | .... |
| Geneva, Utah C11 | 66.00 | 66.50 | .... | .... |
| GraniteCity, Ill. G4 | 67.90 | 68.40 | 68.90 | .... |

| | Basic | No. 2 Foundry | Malleable | Bessemer |
|---|---|---|---|---|
| Ironton, Utah C11 | 66.00 | 66.50 | .... | .... |
| Minnequa, Colo. C10 | 68.00 | 68.50 | 69.00 | .... |
| Rockwood, Tenn. T3 | 62.00 | 62.50‡ | 66.50 | 67.00 |
| Toledo, Ohio I-3 | 66.00 | 66.50 | 66.50 | 67.00 |
| Cincinnati, deld. | 72.94 | 73.44 | .... | .... |
| Mansfield, Ohio, deld. | .... | .... | 71.34 | .... |
| *Canadian District* | | | | |
| Hamilton, Ont. S46 | 65.00 | 65.00 | 65.50 | .... |
| PortColborne, Ont. A25 | 65.00 | 65.00 | 65.50 | 66.00 |
| SaultSte. Marie, Ont. A25 | 65.00 | 65.00 | 65.50 | 66.00 |

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*Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.

**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.

‡Phos. 0.50% up; Phos. 0 30-0.49%, $63.50.

## PIG IRON DIFFERENTIALS

*Silicon:* Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%. Foundry grade, 1.75% or under, deduct 50c.

*Manganese:* Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

## BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.01-6.50% silicon; add 75c for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 13%; starting with silicon over 13% add $1 per ton for each 0.50% silicon or portion thereof up to 14%; over 14%, price is $93 with $1 differential; add $1 for each 0.50% Mn over 1%)

| | |
|---|---|
| Buffalo H1 | $79.25 |
| Jackson, Ohio I-3, J1 | 78.00 |
| PortColborne, Ont. A25 | 78.50 |
| Toledo, Ohio I-3 | 78.00 |

## ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.50% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

| | |
|---|---|
| CalvertCity, Ky. P15 | $99.00 |
| NiagaraFalls, N.Y. P15 | 99.00 |
| Keokuk, Iowa Open-hearth & Fdry, K2 | 89.00 |
| Keokuk, Iowa O.H. & Fdry, 12½ lb piglets, 16% Si, K2 | 92.00 |

## LOW PHOSPHORUS IRON, Gross Ton

| | |
|---|---|
| Birdsboro, Pa. B10 (Phos. 0.075% max) | $73.00 |
| Lyles, Tenn. T3 (Phos. 0.035% max) | 73.00 |
| Rockwood, Tenn. T3 (Phos. 0.035% max) | 73.00 |
| Buffalo H1 (Intermediate) (0.036-0.075% max) | 71.50 |
| Chicago I-3 (Phos. 0.075% max) | 71.00 |
| Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max) | 71.00 |
| Duluth I-3 (Phos. 0.075% max) | 71.00 |
| Erie, Pa. I-3 (Phos. 0.075% max) | 71.00 |
| NevilleIsland, Pa. P6 (Intermediate) (Phos. 0.036-0.075% max) | 71.00 |
| Swedeland, Pa. A3 (Intermediate) (Phos. 0.036-0.075% max) | 71.00 |
| Troy, N.Y. R2 (Phos. 0.075% max) | 73.00 |

# Steel Service Center Products

Representative prices, cents per pound, f.o.b. warehouse, for 2000 lb orders. Prices will vary with total weight of the order. City delivery charges are 15 cents per 100 lb except: Denver, 20 cents; Baltimore, Boston, New York, Philadelphia, San Francisco, 10 cents; Atlanta, Birmingham, Dallas, Houston, Los Angeles, Seattle, no charge.

| | SHEETS | | | STRIP | BARS | | | STRUCTURAL SHAPES | PLATES | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Hot Rolled | Cold Rolled | Galv. | Hot Rolled | H.R. Rounds | C.F. Rounds | H.R. Alloy 4140 | | Carbon | Floor |
| Atlanta | 9.37 | 10.61 | 11.85 | 10.85 | 9.53 | 13.24 | .... | 9.94 | 9.73 | 11.16 |
| Baltimore | 9.50 | 10.26 | 10.06 | 11.25 | 9.65 | 11.70 | 16.38 | 9.85 | 9.60 | 11.10 |
| Birmingham | 8.46 | 10.20 | 10.59 | 9.45 | 8.26 | 13.14 | 16.65 | 8.47 | 8.41 | 10.05 |
| Boston | 9.90 | 10.40 | 11.52 | 12.40 | 10.05 | 13.35 | 16.59 | 10.50 | 9.83 | 11.85 |
| Buffalo | 9.30 | 10.05 | 11.80 | 11.70 | 9.45 | 11.45 | 16.30 | 9.90 | 9.40 | 11.80 |
| Charlotte, N. C. | 9.95 | 11.22 | 10.55 | 11.35 | 10.00 | 12.68 | .... | 10.20 | 9.95 | 11.75 |
| Chicago | 9.22 | 10.20 | 10.13 | 11.39 | 9.22 | 10.65 | 15.95 | 9.57 | 9.06 | 11.35 |
| Cincinnati | 9.38 | 10.26 | 10.18 | 11.71 | 9.33 | 11.53 | 16.27 | 10.14 | 9.44 | 11.68 |
| Cleveland | 9.22 | 10.66 | 10.92 | 11.51 | 9.33 | 11.25 | 16.06 | 9.96 | 9.30 | 11.59 |
| Dallas | 9.07 | 9.88 | 11.75 | 10.63 | 8.48 | 12.98 | 16.95 | 8.71 | 8.31 | 9.68 |
| Detroit | 9.48 | 10.46 | 10.50 | 11.76 | 9.53 | 11.01 | 16.23 | 10.14 | 9.43 | 11.61 |
| Denver | 9.41 | 11.77 | 12.11 | 9.86 | 10.10 | 11.47 | .... | 10.02 | 9.69 | 11.83 |
| Houston | 8.67 | 9.48 | 11.35 | 10.23 | 8.08 | 13.10 | 16.55 | 8.31 | 8.00 | 9.28 |
| Indianapolis | 9 66 | 10.64 | 10.57 | 11.83 | 9.66 | 11.09 | 16.39 | 10.01 | 8.20 | 11.79 |
| KansasCity | 9.21 | 10.87 | 11.35 | 10.87 | 9.31 | 11.57 | 15.72 | 9.80 | 9.10 | .... |
| Los Angeles | 10.35 | 11.20 | 12.10 | 12.40 | 10.25 | 14.20 | 17.35 | 10.45 | 10.30 | 12.30 |
| Memphis, Tenn. | 9.63 | 10.35 | 10.80 | 11.29 | 9.48 | 12.70 | 16.53 | 9.67 | 9.32 | 11.18 |
| Milwaukee | 9.36 | 10.34 | 10.27 | 11.53 | 9.36 | 10.89 | 16.09 | 9.79 | 9.20 | 11.49 |
| Moline, Ill. | 9.57 | 10.55 | 10.48 | 11.74 | 9.57 | 11.00 | 16.30 | 9.92 | 9.41 | 11.70 |
| Newark, N. J. | 9.81 | 10.34 | 11.54 | 12.37 | 10.05 | 13.25 | 16.40 | 10.35 | 9.79 | 11.82 |
| New York | 10.07 | 10.78 | 11.35 | 12.37 | 10.44 | 13.25 | 16.40 | 10.90 | 10.22 | 11.82 |
| Philadelphia | 9.50 | 10.00 | 10.66 | 11.25 | 9.65 | 11.95 | 16.38 | 9.85 | 9.60 | 11.10 |
| Pittsburgh | 9.22 | 10.53 | 11.68 | 11.49 | 9.22 | 11.25 | 15.95 | 9.57 | 9.06 | 11.35 |
| Portland, Oreg. | 10.40 | 12.25 | 12.35 | 12.40 | 10.40 | 16.65 | 17.85 | 11.00 | 10.55 | 12.70 |
| St. Louis | 9 42 | 10.58 | 10.51 | 11.59 | 9.44 | 11.28 | 16.33 | 9.80 | 9.28 | 11.59 |
| St. Paul | 8.82 | 9.49 | 10.64 | 10.99 | 8.82 | 11.49 | 16.54 | 9.17 | 8.66 | 10.95 |
| San Francisco | 10.65 | 11.65 | 11.75 | 12.70 | 10.55 | 15.10 | 17.25 | 11.10 | 10.80 | 12.95 |
| Seattle | 11.35 | 12.45 | 13.40 | 12.80 | 10.80 | 16.20 | 17.85 | 11.50 | 10.95 | 13.60 |
| Spokane, Wash. | 11.20 | 12.30 | 13.25 | 12.65 | 10.65 | 16.20 | 17.85 | 11.35 | 10.80 | 13.45 |

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Specifications: Hot rolled sheet, sheared edge, 10 Ga. & 36 x 96-120 in.; cold rolled sheets, 20 Ga. & 36 x 96-120 in.; galvanized sheets, 10 Ga. x 36 x 120 in. except Los Angeles, Dallas and Houston, 10 Ga. x 48 x 120 in.; hot rolled strip, ⅛ in. x 1 in.; hot rolled carbon bars, rounds, ¾ in.—1¼ in., M1020; cold finished bars, 1 in., C1018; hot rolled alloy bars, 4140 annealed, 1⅝ in.—2⅞ in. rounds; structural shapes, I beams, 6 x 12½ in.; carbon plate, sheared, through ½ in. x 84 in.; floor plates, ¼ in. x 36 in.

# Refractories

**Fire Clay Brick (per 1000 pieces*)**

*High-Heat Duty:* Ashland, Grahn, Hitchins, Olive Hill, Ky., Athens, Troup, Tex., Clearfield, Curwensville, Lumber, Orviston, West Decatur, Winburne, Snow Shoe, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parrall, Portsmouth, Ohio, Ottawa, Ill., Stevens Pottery, Ga., Canon City, Colo., Frostburg, Md., $133; Templeton, Pa., $135; Salina, Pa., $138; Niles, Ohio, $139; Lehi, Utah, $175.

*Super-Duty:* Ironton, Ohio, St. Louis, Mexico, Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Winburne, Snow Shoe, Pa., New Savage, Frostburg, Md., $200; Stevens Pottery, Ga., $210; Troup, Tex., $215; Lehi, Utah, $263.

**Silica Brick (per 1000 pieces*)**

*Standard:* Alexandria, Claysburg, Mt. Union, Sproul, Hawstone, Thompsontown, Pa., Ensley, Ala., Portsmouth, Ohio, St. Louis, $158; Warren, Niles, Windham, Ohio, $163; E. Chicago, Ind., Joliet, Ill., $168; Canon City, Colo., $173; Lehi, Utah, $183; Los Angeles, $185.

**Semisilica Brick (per 1000 pieces*)**

Woodbridge, N. J., Canon City, Colo., $133; Philadelphia, Clearfield, Pa., $138; Warren, Ohio, $148.

**Ladle Brick (per 1000 pieces*)**

*Dry-Pressed:* Alsey, Ill., Johnstown, Pa., Vandalia, Mo., $97; Chester, New Cumberland, W. Va., Freeport, Vanport, Merrill Station, Clearfield, Pa., Wellesville, Irondale, New Salisbury, Ohio, $100; Portsmouth, Ohio, $102; St. Louis, Mexico, Mo., $120; Lehi, Utah, $175.

**High-Alumina Brick (per 1000 pieces*)**

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo. $250; Danville, Ill., $253; Fords, N. J., Philadelphia, $265; Clearfield, Pa., $230; Orviston, Snow Shoe, Pa., Frostburg, Md., $260; Troup, Tex., $265.

60 *Per cent:* St. Louis, Mexico, Vandalia, Mo., $310; Danville, Ill., $313; Clearfield, Orviston, Snow Shoe, Pa., Frostburg, Md., $320; Troup, Tex., Fords, N. J., Philadelphia, $325.

70 *Per cent:* St. Louis, Mexico, Vandalia, Mo., $350; Danville, Ill., $353; Clearfield, Orviston, Snow Shoe, Pa., Frostburg, Md., $360; Troup Tex., Fords, N. J., Philadelphia, $365.

**Tar Bonded Brick (per ton)**

Dolomite: Narlo, Ohio, $87.50. Dolomite-Magnesite: Hays, Pa., Hammond, Ind., $107; Narlo, Ohio, $109.50. Magnesite: Narlo, Ohio, $128; Hays, Pa., Hammond, Ind., $130.

**Sleeves (per 1000)**

St. Louis, $193; Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., $188; Ottawa, Ill., $205.

**Nozzles (per 1000)**

Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $310; Reesdale, Pa., $355.

**Runners (per 1000)**

Johnstown, Bridgeburg, St. Charles, Clearfield, Pa., $234; Reesdale, Pa., $245.

**Dolomite (per ton)**

Domestic, dead-burned bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Narlo, Ohio, $16.75; Thornton, McCook, Ill., $17; Dolly Siding, Mo., $15.60.

**Magnesite (per net ton)**

Domestic, dead-burned, ½ in. grains with fines, Chewelah, Wash., $46; minus ⅜ in. grains bulk, Luning, Nev., $46; ⅜ in. grains with fines (periclase), Baltimore, $73, Pascagoula, Miss., $90.

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*—9 in. x 4½ x 2.50 straights.

# Canadian Steel

**(Cents per lb, f.o.b. mill, except as otherwise noted)**

| | |
|---|---|
| **Billets, Blooms & Slabs:** | |
| Carbon (N.T.): | |
| Forging | $97.00 |
| Rerolling | 78.00 |
| Alloy (N.T.) | 115.00 |
| **Wire Rods:** | |
| Carbon | 5.70 |
| Alloy | 6.40 |
| **Wire (carload lots):** | |
| Merchant annealed | 8.40 |
| Low carbon indus. | 7.20 |
| Upholstery spring | 8.55 |
| M.B. spring | 8.85 |
| **Bars & Small Shapes:** | |
| Carbon, merchant | 5.30 |
| Carbon, special | 5.85 |
| Alloy | 6.40 |
| **Bar Mill Brands:** | |
| Carbon | 5.40 |
| Alloy | 8.05 |
| **Bars, Reinforcing** | 5.30 |
| **Structural Shapes:** | |
| Standard carbon | 5.50 |
| Angles & zees | 5.40 |
| **Plates, Carbon:** | |
| Sheared | 5.45 |
| Universal mill | 5.10 |
| **Sheets & Coils, Hot Rolled:** | |
| Carbon sheet | 4.95 |
| Carbon strip | 5.00 |
| **Sheets & Coils, Cold Rolled:** | |
| Carbon sheet | 6.35 |
| Carbon strip: | |
| (0.080 and lighter) | 6.35 |
| (0.081 and heavier) | 6.35 |
| **Sheets & Coils, Galvanized:** | |
| Standard quality | 6.70 |
| Culvert quality | 7.00 |
| **Sheets, Porcelain Enameling** | 7.45 |
| **Sheets & Coils, Electrical:** | |
| Field grade | 9.00 |
| Electrical grade | 10.15 |
| **Sheet Piling** | 6.15 |
| **Skelp** | 4.70 |
| **Rails, Heavy** | 5.55 |
| **Rails, Light** | 5.70 |
| **Joint Bars** | 6.55 |
| **Tie Plates** | 6.35 |
| **Grinding Balls** (3 in. diam.) | 7.00 |

# Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted.)

| | Cents |
|---|---|
| Sponge Iron, domestic and foreign, 98% Fe, min. trucklots, freight allowed east of Mississippi River: | |
| 100 mesh, bags | 11.50 |
| 100 mesh, pails | 9.85‡ |
| 40 mesh bags | 7.50†† |
| Electrolytic Iron, | |
| Melting stock, 99.9% Fe, irreg. fragments, ⅛ in. x 1.3 in. | 27.75 |
| (In contract lots of 750 tons price is 22.75c.) | |
| Annealed, 99.5% Fe...36.75, ton deld. east of Mississippi. | |
| Unannealed (99+% Fe) | 33.0 |
| Unannealed (99+% Fe) (minus 325 mesh) | 58.0 |
| Carbonyl Iron: | |
| 90-99.9%, 3 to 20 microns, depending on grade, 88.00-700.00 in standard 200-lb containers; all minus 200 mesh. | |
| Aluminum: | |
| Atomized, 600-lb drum freight allowed, c.l. 42.80; ton lots | 41.80 |
| Brass, 80/20, leaded (60 mesh) | 37.80 |
| Bronze powder, 90/10 | 56.80 |
| Copper, all types | 15.00* |
| Lead | 7.50* |
| Manganese, 500 lb and up | 25.00* |
| Nickel, all types | 0.78-1.06 |
| Nickel-Silver | 56.00 |
| Solder | 7.00* |
| Stainless Steel, 304 | 89.00 |
| Stainless Steel, 316 | $1.07 |
| Steel, AISI 4600 | 32.00 |
| Tin | 14.00* |
| Zinc | 23.20 |
| Cobalt: | Dollars |
| 98.5%, minus 100-300 mesh | 1.57-1.58 |
| 99.5% below 5 microns | 2.32 |
| Molybdenum | 4.35 |

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*Plus cost of metal. ‡Depending on mesh. §Cutting and scarfing grades. **Depending on price of ore. ††Welding grade.

# Imported Steel

Base per 100 lb, landed, duty paid; based on current ocean rates with any rise for buyer's acc't. (Source of shipment: Western Continental Europe.)

| | North Atlantic | Great Lakes | South Atlantic | Gulf Coast | West Coast |
|---|---|---|---|---|---|
| Deformed Bars, Intermediate, ASTM-A 305 | $5.15 | .... | $5.10 | $5.00 | $5.30 |
| Bar Size Angles | 5.15 | .... | 5.10 | 5.00 | 5.30 |
| Structural Angles | 5.05 | .... | 5.00 | 4.90 | 5.20 |
| I-Beams | 5.05 | .... | 5.00 | 4.90 | 5.20 |
| Channels | 5.15 | .... | 5.10 | 5.00 | 5.30 |
| Plates (basic bessemer) | 5.30 | .... | 5.25 | 5.15 | 5.45 |
| Sheets, hot rolled and galvanized | Nom. | .... | Nom. | Nom. | Nom. |
| Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft | 24.16 | .... | 24.09 | 23.81 | 25.54 |
| Barbed Wire (†) | 6.25 | .... | 6.20 | 6.10 | 6.40 |
| Merchant Bars | 5.15 | .... | 5.10 | 5.00 | 5.30 |
| Hot-Rolled Bands | 5.65 | .... | 5.60 | 5.50 | 5.80 |
| Wire Rods, Thomas No. 5 (Niederrhein) | 5.80* | .... | 5.75 | 5.75 | 6.00 |
| Wire Rods, O.H., No. 5 (Niederrhein) | 6.00* | .... | 5.95 | 5.95 | 6.20 |
| Bright Common Wire Nails (§) | 7.15 | .... | 7.10 | 7.00 | 7.30 |
| (Source of Shipment: Japan) | | | | | |
| Wire, galvanized | $8.62 | .... | $8.62 | $8.62 | $8.57 |
| Wire, bright | 7.60 | .... | 7.60 | 7.60 | 7.55 |
| Wire Rods, O.H. No. 5 (Sumitomo) | 5.80 | .... | 5.80 | 5.75 | 6.00 |
| Strand, stress relieved (Sumitomo) | | | | | |
| ⅜ in. diam, 1000 lineal ft | 39.90 | .... | 39.90 | 39.90 | 39.50 |
| $\frac{7}{16}$ in. diam, 1000 lineal ft | 53.50 | .... | 53.50 | 53.50 | 53.00 |
| Bright common wire nails | 7.15 | .... | 7.15 | 7.15 | 7.15 |

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†Per 82 lb net reel. §Per 100 lb keg, 20d and heavier. *Except Boston.

# Ores

**Lake Superior Iron Ore**

(Prices effective for the 1961 shipping season, subject to later revision, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

| | |
|---|---|
| Mesabi nonbessemer | $11.45 |
| Mesabi bessemer | 11.60 |
| Old Range nonbessemer | 11.70 |
| Old Range bessemer | 11.85 |
| Open-hearth lump | 12.70 |
| High phos. | 11.45 |

Based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 1, 1961; increases or decreases after that date are absorbed by the seller.

**Eastern Local Iron Ore**

| | |
|---|---|
| New Jersey, concentrates | nom. |

**Foreign Iron Ore**

Cents per unit

| | |
|---|---|
| Swedish basic, 65%, c.i.f. Atlantic ports | 25.00† |
| Chilean, 62-65%, c.i.f. Atlantic ports | 22.00 |
| Brazilian (lump), 68.5%, f.o.b. vessel, Victoria, per ton | $11.50 |

**Tungsten Ore**

Net ton, unit

| | |
|---|---|
| Foreign wolframite, good commercial quality | $15.75-16.25* |
| Domestic, concentrates, f.o.b. milling points | 22.00-23.00 |

**Manganese Ore**

Mn 46-48%, Indian, 85-90c, nom. per long ton unit, c.i.f. U. S. ports, duty for buyer's account.

**Chrome Ore**

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

| | |
|---|---|
| *Indian and Rhodesian* | |
| 48% 3:1 | $34.00-35.00† |
| 48% no ratio | 25.00-26.00† |
| *South African Transvaal* | |
| 44% no ratio | 18.75 |
| 48% no ratio | 24.00-26.00† |
| *Turkish* | |
| 48% 3:1 | 35.00-37.00† |
| *Domestic* | |
| Rail nearest seller | |
| 18% 3:1 | 30.00 |

**Molybdenum**

| | |
|---|---|
| Sulfide concentrate, per lb of Mo content, mines, unpacked | $1.40 |

**Antimony Ore**

Per short ton unit of Sb content, c.i.f. seaboard

| | |
|---|---|
| 55-60% | $3.00-3.50 |
| 60-65% | 3.60-4.00 |

**Vanadium Ore**

Cents per lb $V_2O_5$

| | |
|---|---|
| Domestic | 31.00 |

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*Before duty. †Nominal.

# Metallurgical Coke

Price per net ton

| | |
|---|---|
| **Beehive Ovens** | |
| Connellsville, Pa. furnace | $14.75-15.25 |
| Connellsville, Pa. foundry | 18.00-18.50 |
| **Oven Foundry** | |
| Birmingham, ovens | $30.35 |
| Cincinnati, deld. | 33.34 |
| Buffalo, ovens | 32.00 |
| Chattanooga, Tenn., ovens | 30.80 |
| Detroit, ovens | 32.00 |
| Pontiac, Mich., deld. | 34.05 |
| Saginaw, Mich., deld. | 35.63 |
| Erie, Pa., ovens | 32.00 |
| Indianapolis, ovens | 31.25 |
| Ironton, Ohio, ovens | 30.50 |
| Cincinnati, deld. | 33.64 |
| Kearny, N. J., ovens | 31.25 |
| Milwaukee, ovens | 32.00 |
| Neville Island (Pittsburgh), Pa., ovens | 30.75 |
| New Haven, Conn., ovens | 31.00 |
| Painesville, Ohio, ovens | 32.00 |
| Cleveland, deld. | 34.45 |
| Philadelphia, ovens | 31.00 |
| St. Louis, ovens | 33.00 |
| St. Paul, ovens | 31.25 |
| Chicago, deld. | 34.78 |
| Swedeland, Pa., ovens | 31.00 |
| Terre Haute, Ind., ovens | 31.25 |

# Coal Chemicals

(Representative prices)

| | |
|---|---|
| Cents per gal f.o.b. tank cars or tank trucks, plant. | |
| Pure benzene | 34.00 |
| Xylene, industrial grade | 29.00 |
| Creosote | 24.00 |
| Naphthalene, 78 deg. | 6.00 |
| Toluene, one deg. (deld. east of Rockies) | 25.00 |
| Cents per lb, f.o.b. tank cars or tank trucks, deld. | |
| Phenol, 90 per cent grade | 14.75 |
| Per ton bulk, f.o.b. cars or trucks, plant. | |
| Ammonium sulfate, regular grade | $32.00 |

# Ferroalloys

## MANGANESE ALLOYS

**Spiegeleisen:** Carlot, 10 lb pigs, per gross ton, Palmerton, Pa., 21-23% Mn, $102.50; 19-21% Mn, 1-3% Si, $100; 16-19% Mn, $98. For Neville Island, Pa., prices add $2.50. Lump 35 lb and down: Deduct $2 from 10 lb pig prices at Palmerton.

**Standard Ferromanganese:** (Mn 74-76%, C 7% approx) base price per net ton, $220, Johnstown, Duquesne, Sheridan, Neville Island, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Rockwood, Tenn.; Houston, Tex.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively (Mn 79-81%). Lump $228 per net ton, f.o.b. Anaconda, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

**High-Grade Low-Carbon Ferromanganese:** (Mn 85-95%). Carload, lump, bulk, max 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 4c for max 0.15% C grade from above prices, 5.3% for max 0.03% C, 6.6c for max 0.5% C, and 8.1c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max), Add 2.05c to the above prices. Spot, add 0.25c.

**Medium-Carbon Ferromanganese:** (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 24c per lb of contained Mn; packed, carload 25.3c, ton lot 26.9c, less ton 28.1c.

**Electrolytic Manganese Metal:** Min carload, bulk, 34.25c; 2000 lb to min carload, 37c; less ton, 39c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi River; or f.o.b. Marietta, O., freight allowed.

**Silicomanganese:** (Mn 65-68%), Carload, lump, bulk, 1.50% C grade, 18.5-21% Si, 11.6c per lb of alloy. Packed, c.l. 12.8c, ton 13.25c, less ton 14.25c, f.o.b. Alloy; W. Va.; Ashtabula, Marietta, O.; Rockwood, Tenn.; Houston, Tex.; Sheffield, Ala.; Portland, Oreg. For 2% C grade, Si 16-18.5%, deduct 0.2c from above prices. For 3% grade, Si 12.5-16%, deduct 0.5c from above prices. Spot, add 0.25c.

## TITANIUM ALLOYS

**Ferrotitanium, Low-Carbon:** (Ti 20-25%, Al 3.5% max, Si 5% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton to 300 lb. $1. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton to 300 lb $1.27, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

**Ferrotitanium, High-Carbon:** (Ti 15-18%, C 6-8%). Contract min c.l. $250 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi River and north of Baltimore and St. Louis. Spot, $255.

**Ferrotitanium, Medium-Carbon:** (Ti 17-21%, C 2-4%). Contract, c.l. $300 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed. Spot, $305.

## CHROMIUM ALLOYS

**High-Carbon Ferrochrome:** C.l. lump, bulk, 24.00c per lb of contained Cr. Delivered.

**Charge Chrome:** Cr 58-65%, C 5.25% max, Si 3% max, S 0.03% max, 22.00c per lb of contained Cr, carlots, lump, bulk, delivered.

**Blocking Chrome:** Cr 55-63%, C 4-6%, Si 8-12%, S 0.03% max, 23.00c per lb of contained Cr, delivered in carlots, lump, bulk.

**Refined Chrome:** Cr 58-65%, C 4.25% max, Si 1.0% max, S 0.03% max, 24.00c per lb of contained Cr, carlots, lump, bulk, delivered.

**Low-Carbon Ferrochrome:** (Simplex) Cr 68-71%: C 0.025% max, 33.00c; C 0.010% max, 33.50c per lb of contained Cr, carlots, lump, bulk, delivered.

Cr 68-73%; C 0.25% max, 33.50c. Cr 67-73% C 0.05% max, 33.00c; C 0.75% max, 33.00c; C 2.0% max, 32.5c, carlots, lump, bulk, delivered.

**Foundry Ferrochrome, High-Carbon:** (Cr 62-66%, C 5-7%, Si 7-10%). C.l., 2" x D, bulk 30.8c per lb of contained Cr. Packed, c.l. 32.4c, ton 34.2c, less ton 35.7c. Delivered. Spot, add 0.25c.

**Ferrosilicon Chrome:** (Cr 50-54%, Si 28-32%, C 1.25 max). 8M x D, carload, bulk, 36.50c.

**Ferrochrome-Silicon:** Cr 39-41%, Si 42-45%, C 0.05% max, 11.50c per lb material; Cr 44-47%, Si 37-39%, C 0.15% max, 12.60c per lb material.

**Chromium Metal, Electrolytic:** Commercial grade (C 99.8% min, metallic basis Fe 0.2% max). Contract, carlot packed, 2" x D plate (above ¼" thick) $1.15 per lb, ton lot $1.17, less ton lot $1.19. Delivered. Spot, add 5c.

## VANADIUM ALLOYS

**Ferrovanadium:** Open hearth grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade:** (V 50-55% or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

**Grainal:** Vanadium Grainal No. 1, $1.05 per lb; No. 79, 50c, freight allowed.

**Vanadium Oxide:** Contract, less carload lot, packed, $1.38 per lb contained $V_2O_5$ freight allowed. Spot, add 5c.

## SILICON ALLOYS

**50% Ferrosilicon:** Carload, lump, bulk, 13.5c per lb contained Si. Packed, c.l. 16.0c, ton lot 17.45c, less ton 19.1c f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Chattanooga, Rockwood, Tenn.; Houston, Tex.; Sheffield, Ala.; Keokuk, Iowa; Portland, Oreg. Spot, add 0.45c.

**Low-Aluminum 50% Ferrosilicon:** (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

**65% Ferrosilicon:** Carload, lump, bulk, 15.75c per lb contained silicon. Packed, c.l. 17.75c, ton lot 19.55c, less ton 20.9c. Delivered. Spot, add 0.35c.

**75% Ferrosilicon:** Carload, lump, bulk, 16.9c per lb of contained Si. Packed, c.l. 18.8c, ton lot 20.45c, less ton 21.7c. Delivered. Spot add 0.3c.

**90% Ferrosilicon:** Carload, lump, bulk, 20c per lb of contained Si. Packed, c.l. 21.65c, ton lot 23.05c, less ton 24.1c. Delivered. Spot, add 0.25c.

**Silicon Metal:** (98% min Si, 1.00% max Fe, 0.7% max Ca). C.l. lump, bulk, 21.5c per lb of Si. Packed, c.l. 23.15c, ton lot 24.45c, less ton 25.45c. Add 0.5c for max 0.03% Ca grade. Add 0.5c for 0.50% Fe grade analyzing 98.25% min Si.

**Alsifer:** (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.85c per lb of alloy; ton lots, packed, 10.85c.

## ZIRCONIUM ALLOYS

**12-15% Zirconium Alloy:** (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l., lump, bulk, 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

**35-40% Zirconium Alloy:** (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Carload, bulk, 26.25c per lb of alloy, carload, lump, packed 27.25c, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

## CALCIUM ALLOYS

**Calcium-Manganese-Silicon:** (Ca 16-20%, Mn 14-18% and Si 53-59%). Carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot add 0.25c.

**Calcium-Silicon:** (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

## TUNGSTEN ALLOYS

**Ferrotungsten:** (70-80%). $2.45 per lb (all quantities) of contained W. Delivered.

## BORON ALLOYS

**Ferroboron:** 100 lb or more packed (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices 100 lb and over are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

**Borosil:** (3 to 4% B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, $5.25 per lb of contained B. Packed, carload, $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

**Carbortam:** (B 1 to 2%). Lump, carload $320 per ton, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

## BRIQUETTED ALLOYS

**Chromium Briquets:** (Weighing approx 3½ lb each and containing 2 lb of Cr). Carload, bulk 19.60c per lb of briquet, in bags 20.70c; 3000 lb to c.l. pallets 20.80c; 2000 lb to c.l. in bags 21.90c; less than 2000 lb in bags 22.80c. Delivered. Spot, add 0.25c.

**Ferromanganese Briquets:** (Weighing approx 3 lb and containing 2 lb of Mn). Carload, bulk 13.7c per lb of briquet; c.l. packed, bags 14.9c; 3000 lb to c.l., pallets 14.9c; 2000 lb to c.l., bags 16.1c; less ton 17c. Delivered. Spot, add 0.25c.

**Silicomanganese Briquets:** (Weighing approx 3½ lb and containing 2 lb of Mn and approx ½ lb of Si). C.l. bulk 14c per lb briquet; c.l. packed, bags 15.2c; 3000 lb to c.l., pallets 15.2c; 2000 lb to c.l., bags 16.4c; less ton 17.3c. Delivered. Spot, add 0.25c.

**Silicon Briquets:** (Large size—weighing approx 5 lb and containing 2 lb of Si and small sizes, weighing approx 2½ lb and containing 1 lb of Si). Carload bulk 8c per lb of briquet; packed, bags 9.2c; 3000 lb to c.l., pallets 9.6c; 2000 lb to c.l., bags 10.8c; less ton 11.7c. Delivered. Spot, add 0.25c.

**Molybdic-Oxide Briquets:** (Containing 2½ lb of Mo each). $1.60 per lb of Mo contained, f.o.b. Langeloth, Pa.

**Titanium Briquets:** Ti 98.27%, $1 per lb f.o.b. Niagara Falls, N. Y.

## OTHER FERROALLOYS

**Ferrocolumbium:** (Cb 50-60%, Si 4% max, C 0.1% max). Ton lots 2" x D, $3.45 per lb of contained Cb; less ton lots $3.50 (nominal). Delivered.

**Ferrotantalum Columbium:** (Cb 44-47% approx, Ta 15% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lots 2" x D, $3.05 per lb of contained Cb plus Ta, delivered; less ton lots, $3.10.

**SMZ Alloy:** (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Carload, bulk 19.25c per lb of alloy, c.l. packed ½ in. x 12 M 20.00c, ton lot 21.15c, less ton 22.40c. Delivered. Spot, add 0.25c.

**Graphidox No. 4:** (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l., packed 20c per lb of alloy, ton lot 21.15c; less ton lot 22.4c, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

**V-5 Foundry Alloy:** (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.45c per lb of alloy; ton lot 19.95c; less ton lot 21.20c, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

**Siminal:** (Approx 20% each Si, Mn, Al; bal Fe). Lump, carload, bulk, 19.25c. Packed c.l. 20.25c; 2000 lb to c.l. 21.25c; less than 2000 lb 21.75c per lb of alloy. Delivered.

**Ferrophosphorus:** (23-25% based on 24% P content with unitage of $5 for each 1% of P above or below the base). Carload, bulk, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $120 per gross ton.

**Ferromolybdenum:** (65-70%). Per lb of contained Mo in 2000-lb container, f.o.b. Langeloth and Washington, Pa., $1.89 in all sizes except powdered which is $1.95.

**Technical Molybdic-Oxide:** Per lb of contained Mo, in cans $1.60; in bags, $1.59, f.o.b. Langeloth and Washington, Pa.

# Scrap Price Index Still Dropping

## Softer market at some collection points reflects sluggish domestic demand and slightly slower export movement. Failure of steel ingot rate to rise discourages buying

Scrap Prices, Page 120

- **Chicago**—Steelmaking grades of scrap have weakened further in the face of meager demand and a reduced steelmaking rate. Prices are down about $1 a ton. Orders for finished steel are failing to come up to expectations, and mills are producing at a level that is geared closely to their shipments. For the last several weeks, they have been building up semifinished inventories in anticipation of a brisk steel demand. With new business failing to materialize in the volume anticipated, present semifinished inventory is adequate.

- **Pittsburgh** — Most prices unchanged. Although district steelmaking operations are close to the year's highest level, there's little consumer interest. No. 2 bundles are off $1 a ton on the latest purchase by a local mill.

- **Philadelphia**—Demand is slower, but prices are unchanged except for a slight decline in heavy breakable cast to $41-$42, delivered. Demand for export shows noticeable softening with prices off $2 to $3 from those prevailing in recent weeks.

- **New York** — Though there's an easier undertone in the scrap export market, the loading program here remains unchanged; and prices reflect little variation from those recently prevailing. Domestic inquiry is slow, and in turnings, the market remains nominal. In the stainless scrap specialties, 18-8 sheets, clips, and solids are off $160 with consumer inventories high.

- **Cleveland**—Little new business is being booked with steelmaking operations failing to come up to expectations. Some dealers are an-

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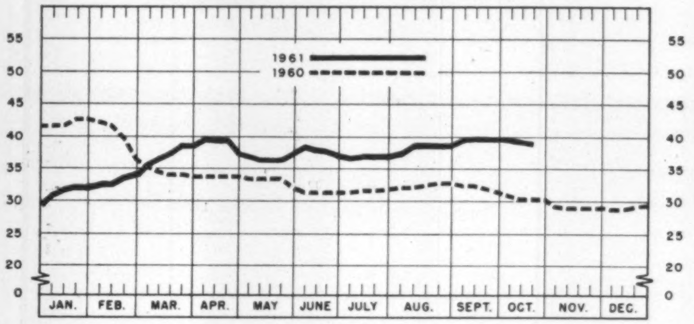
### STEELMAKING SCRAP PRICE COMPOSITE

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania—Compiled by STEEL.



| Oct. 18 1961 | Week Ago | Month Ago | Year Ago | Sept. Avg |
|---|---|---|---|---|
| **$38.83** | **$39.17** | **$39.83** | **$30.17** | **$39.75** |

ticipating a further decline in prices on the steelmaking grades when new orders come out for November shipment. Brokers are reported buying material to fill recent commitments, but they are paying $1 per ton less than recently quoted.

- **Detroit**—Prices are softer here as the export market closes down temporarily with the end of the lake shipping season nearing. Expectation of labor difficulty at Chrysler plants adds a weakening influence. The No. 1 grades are quoted about $1 a ton lower.

- **Buffalo**—Steelmakers in this area are showing little interest in No. 1 grades of scrap, largely confining their purchases to No. 2 bundles and the turnings grades. As a result, prices on the primary grades are easier. The outlook for mill buying in November isn't overly promising. However, less reciprocal auto scrap will be available to area mills and that could stimulate demand for dealer material.

- **St. Louis**—Further softening is reported in this market, and the trade is convinced the bottom has not been reached. There's a general feeling prices will slip further. Cast iron is especially weak, and the No. 2 grades of steelmaking scrap are hard to sell. The export market is thinner.

Tonnage is still moving to the mills but in smaller tonnages. There is no large accumulation of material. Prices on most of the open hearth grades dropped $1 a ton last week.

- **Cincinnati** — The market continues weak in the absence of representative buying of many grades. A local mill is taking only the No. 1 grades, and another area mill is out of the market entirely. The trade is awaiting bids on monthend industrial lists to point the way.

- **Houston** — Scrap prices are expected to drop about $2 a ton on November delivery purchases. Export buying is at a standstill with Japanese shipments for the current quarter extended into the next quarter. October shipments to domestic consumers are ahead of schedule, and outstanding commitments are being covered easily. The cast iron market is weak on meager demand.

- **Birmingham** — The market appears to be easier, reflecting sluggish demand. Electric furnaces material, 3 ft and under, is down $1 a ton to $37-$38. No. 1 heavy melting and No. 1 bundles are also off $1 a ton. So are certain cast iron grades.

- **San Francisco**—Dealers anticipate a price decline on No. 1 heavy melting on November purchases. Domestic demand is lagging, but export business is described as good.

- **Los Angeles**—Scrap trading was halted here last week by a strike that tied up operations in ten local yards.

- **Seattle**—Scrap dealers here note a slight recession in domestic buying but the export market continues active and is providing support for prices. Supply of No. 1 heavy melting is still short. Demand for No. 2 heavy melting and bundles is also good. Congestion at Japanese ports is still hampering shipments. Local buyers are interested in bid proposals Oct. 31 for a 541 ft cruiser offered for sale at the Puget Sound Navy Yard for scrapping. The yield of scrap is estimated at 3000 tons.

## Domestic Consumption of Scrap Rises in August

Domestic consumption of ferrous scrap in August (4,977,000 gross tons) was 16 per cent greater than July's, reports the U. S. Bureau of Mines. The total charge of scrap and pig iron (10,144,000 tons) was 9 per cent higher than it was in the previous month and consisted of 49 per cent scrap and 51 per cent pig iron vs. 46 per cent scrap and 54 per cent pig iron in July.

Consumer stocks of scrap on Aug. 31 totaled 7,641,000 tons, a small

*(Please turn to Page 125)*

WARD
For Countless Uses
of
SPRING STEEL
●
AMERICA'S LEADING SUPPLIER
Where
SERVICE and QUALITY
is the rule
●
WARD STEEL CO.
Boston—Cambridge, Mass.
Chicago, Ill.—Greensboro, N. C.

# Iron and Steel Scrap

Consumer prices per gross ton, except as otherwise noted, including brokers' commission, as reported to STEEL, Oct. 18, 1961. *Changes shown in italics.*

## STEELMAKING SCRAP COMPOSITE

| | |
|---|---|
| Oct. 18 | $38.83 |
| Oct. 11 | 39.17 |
| Sept. Avg. | 39.75 |
| Oct. 1960 | 30.04 |
| Oct. 1956 | 57.27 |

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania.

### PITTSBURGH

| | |
|---|---|
| No. 1 heavy melting | 37.00-38.00 |
| No. 2 heavy melting | 29.00-30.00 |
| No. 1 dealer bundles | 38.00-39.00 |
| *No. 2 bundles* | *26.00-27.00* |
| No. 1 busheling | 37.00-38.00 |
| No. 1 factory bundles | 44.00-45.00 |
| Machine shop turnings | 15.00-16.00 |
| Mixed borings, turnings | 15.00-16.00 |
| Shovel turnings | 20.00-21.00 |
| Cast iron borings | 19.00-20.00 |
| Cut structurals: | |
| 2 ft and under | 43.00-44.00 |
| 3 ft and under | 40.00-41.00 |
| Heavy turnings | 31.00-32.00 |
| Punchings & Plate scrap | 45.00-46.00 |
| Electric furnace bundles | 42.00-43.00 |

Cast Iron Grades (F.o.b. shipping point)

| | |
|---|---|
| No. 1 cupola | 34.00-35.00 |
| Stove plate | 34.00-35.00 |
| Unstripped motor blocks | 24:00-25.00 |
| Clean auto cast | 35.00-36.00 |
| Drop broken machinery | 47.00-48.00§ |

Railroad Scrap

| | |
|---|---|
| No. 1 R.R. heavy melt. | 43.00-44.00 |
| Rails, 2 ft and under | 51.00-52.00 |
| Rails, 18 in. and under | 52.00-53.00 |
| Random rails | 46.00-47.00 |
| Angles, splice bars | 44.00-45.00 |
| Railroad specialties | 48.00-49.00 |
| Rails, rerolling | 58.00-59.00 |

Stainless Steel Scrap

| | |
|---|---|
| 18-8 bundles & solids | 190.00-195.00 |
| 18-8 turnings | 115.00-120.00 |
| 430 bundles & solids | 90.00-95.00 |
| 410 turnings | 55.00-60.00 |

### CHICAGO

| | |
|---|---|
| *No. 1 hvy melt., indus.* | *39.00-40.00* |
| *No. 1 hvy melt., dealer* | *37.00-38.00* |
| No. 2 hvy melting | 33.00-34.00 |
| *No. 1 factory bundles* | *42.00-43.00* |
| *No. 1 dealer bundles* | *39.00-40.00* |
| *No. 2 bundles* | *23.00-24.00* |
| *No. 1 busheling, indus.* | *39.00-40.00* |
| *No. 1 busheling, dealer* | *37.00-38.00* |
| *Machine shop turnings* | *17.00-18.00* |
| *Mixed borings, turnings* | *19.00-20.00* |
| Shovel turnings | 20.00-21.00 |
| *Cast iron borings* | *19.00-20.00* |
| *Cut structurals, 3 ft* | *45.00-46.00* |
| *Punchings & plate scrap* | *47.00-48.00* |

Cast Iron Grades

| | |
|---|---|
| No. 1 cupola | 42.00-43.00 |
| *Stove plate* | *36.00-37.00* |
| Unstripped motor blocks | 34.00-35.00 |
| Clean auto cast | 47.00-48.00 |
| Drop broken machinery | 47.00-48.00 |

Railroad Scrap

| | |
|---|---|
| *No. 1 R.R. heavy melt.* | *41.00-42.00* |
| R.R. malleable | 47.00-48.00 |
| Rails, 2 ft and under | 50.00-51.00 |
| Rails, 18 in. and under | 52.00-53.00 |
| Angles, splice bars | 45.00-46.00 |
| Axles | 56.00-57.00 |
| *Rails, rerolling* | *59.00-60.00* |

Stainless Steel Scrap

| | |
|---|---|
| 18-8 bundles, solids | 185.00-190.00 |
| 18-8 turnings | 105.00-110.00 |
| 430 bundles & solids | 90.00-95.00 |
| 430 turnings | 50.00-55.00 |

### BUFFALO

| | |
|---|---|
| No. 1 heavy melting | 32.00-33.00 |
| No. 2 heavy melting | 26.00-27.00 |
| No. 1 bundles | 32.00-33.00 |
| No. 2 bundles | 24.00-25.00 |
| No. 1 busheling | 32.00-33.00 |
| Shovel turnings | 17.00-18.00 |
| Machine shop turnings | 13.00-14.00 |
| Cast iron borings | 15.00-16.00 |
| Low phos. structurals and plates, 2 ft and under | 40.00-41.00 |

Cast Iron Grades (F.o.b. shipping point)

| | |
|---|---|
| No. 1 cupola | 37.00-38.00 |
| No. 1 machinery | 44.00-45.00 |

Railroad Scrap

| | |
|---|---|
| Rails, random lengths | 43.00-44.00 |
| Rails, 3 ft and under | 49.00-50.00 |
| Railroad specialties | 42.00-43.00 |
| Rails, rerolling | 64.00-65.00 |

### CLEVELAND

| | |
|---|---|
| No. 1 heavy melting | 36.00-37.00 |
| No. 2 heavy melting | 24.00-25.00† |
| No. 1 factory bundles | 41.00-42.00 |
| No. 1 bundles | 36.00-37.00 |
| No. 2 bundles | 23.00-24.00† |
| No. 1 busheling | 36.00-37.00 |
| Machine shop turnings | 15.00-16.00 |
| Shovel turnings | 19.00-20.00 |
| Mixed borings, turnings | 19.00-20.00 |
| Cast iron borings | 19.00-20.00 |
| Cut foundry steel | 35.50-36.50 |
| Cut structurals, plate 2 ft and under | 41.00-42.00 |
| *Low phos. punchings & plate* | *36.00-37.00* |
| Alloy free, short shovel turnings | 20.00-21.00 |
| *Electric furnace bundles* | *36.00-37.00* |

Cast Iron Grades

| | |
|---|---|
| No. 1 cupola | 37.00-38.00 |
| Charging box cast | 26.00-27.00 |
| Heavy breakable cast | 26.00-27.00 |
| Stove plate | 34.00-35.00 |
| Unstripped motor blocks | 29.00-30.00 |
| Brake shoes | 37.00-38.00 |
| Clean auto cast | 42.00-43.00 |
| Burnt cast | 30.00-31.00 |
| Drop broken machinery | 45.00-46.00 |

Railroad Scrap

| | |
|---|---|
| R.R. malleable | 50.00-51.00 |
| Rails, 2 ft and under | 50.00-51.00 |
| Rails, random lengths | 47.00-48.00 |
| Rails, 18 in. and under | 52.00-53.00 |
| Cast steel | 39.00-40.00 |
| No. 1 railroad cast | 44.00-45.00 |
| Railroad specialties | 46.00-47.00 |
| Angles, splice bars | 44.00-45.00 |
| Rails, rerolling | 55.00-56.00 |

Stainless Steel Scrap (Brokers' buying prices; f.o.b. shipping point)

| | |
|---|---|
| 18-8 bundles, solids | 165.00-170.00 |
| 18-8 turnings | 95.00-100.00 |
| 430 clips, bundles, solids | 80.00-85.00 |
| 430 turnings | 15.00-25.00† |

### YOUNGSTOWN

| | |
|---|---|
| No. 1 heavy melting | 39.00-40.00 |
| No. 2 heavy melting | 25.00-26.00† |
| No. 1 busheling | 39.00-40.00 |
| No. 1 bundles | 39.00-40.00 |
| No. 2 bundles | 25.00-26.00† |
| Machine shop turnings | 17.00-18.00 |
| Shovel turnings | 22.00-23.00 |
| Cast iron borings | 22.00-23.00 |
| *Low phos.* | *40.00-41.00* |
| *Electric furnace bundles* | *40.00-41.00* |

Railroad Scrap

| | |
|---|---|
| *No. 1 R.R. heavy melt.* | *40.00-41.00* |

### CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

| | |
|---|---|
| No. 1 heavy melting | 35.00-36.00 |
| No. 2 heavy melting | 28.00-29.00 |
| No. 1 bundles | 36.00-37.00 |
| No. 2 bundles | 21.00-22.00 |
| No. 1 busheling | 35.00-36.00 |
| Machine shop turnings | 9.00-10.00 |
| Mixed borings, turnings | 12.00-13.00 |
| Shovel turnings | 14.00-15.00 |
| Cast iron borings | 14.00-15.00 |
| Low phos., 18 in. | 40.00-41.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 cupola | 34.00-35.00 |
| Heavy breakable cast | 30.00-31.00 |
| Charging box cast | 34.00-35.00 |
| Drop broken machinery | 46.00-47.00 |

Railroad Scrap

| | |
|---|---|
| No. 1 R.R. heavy melt. | 40.00-41.00 |
| Rails, 18 in. and under | 48.00-49.00 |
| Rails, random lengths | 42.00-43.00 |

### DETROIT (Brokers' buying prices)

| | |
|---|---|
| *No. 1 heavy melting* | *32.00-33.00* |
| No. 2 heavy melting | 25.00-26.00 |
| *No. 1 bundles* | *33.00-34.00* |
| No. 2 bundles | 23.00-24.00 |
| *No. 1 busheling* | *31.00-32.00* |
| Machine shop turnings | 10.00-11.00 |
| Mixed borings, turnings | 11.00-12.00 |
| Shovel turnings | 12.00-13.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 cupola | 33.00-34.00 |
| Mixed cast | 30.00-31.00 |
| Stove plate | 28.00-29.00 |
| Heavy breakable | 27.00-28.00 |
| Unstripped motor blocks | 22.00-23.00 |
| Clean auto cast | 39.00-40.00 |

Stainless Steel Scrap

| | |
|---|---|
| *18-8 bundles & solids* | *165.00-170.00* |
| *18-8 turnings* | *75.00-80.00* |
| 430 bundles & solids | 70.00-75.00 |

### PHILADELPHIA

| | |
|---|---|
| No. 1 heavy melting | 40.00-41.00 |
| No. 2 heavy melting | 36.00-37.00 |
| No. 1 bundles | 43.00 |
| No. 2 bundles | 26.00-27.00 |
| No. 1 busheling | 43.00 |
| Electric furnace bundles | 45.00 |
| Mixed borings, turnings | 17.00† |
| Shovel turnings | 20.00 |
| Machine shop turnings | 14.00 |
| Heavy turnings | 25.00† |
| Structurals & plates | 45.00-46.00 |
| Couplers, springs, wheels | 46.00 |
| Rail crops, 2 ft & under | 52.00-54.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 cupola | 40.00 |
| *Heavy breakable cast* | *41.00-42.00* |
| Drop broken machinery | 49.00-50.00† |
| Malleable | 49.00† |

### NEW YORK (Brokers' buying prices)

| | |
|---|---|
| No. 1 heavy melting | 30.00-31.00 |
| No. 2 heavy melting | 23.00-24.00 |
| No. 1 bundles | 30.00-31.00 |
| No. 2 bundles | 20.00-21.00 |
| Machine shop turnings | 4.50-5.00† |
| Mixed borings, turnings | 5.00-5.50† |
| Shovel turnings | 6.00-7.00† |
| Low phos. structurals & plates | 34.00-35.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 cupola | 34.00-35.00 |
| Unstripped motor blocks | 25.00-26.00 |
| Heavy breakable | 32.00-33.00 |

Stainless Steel

| | |
|---|---|
| *18-8 sheets, clips, solids* | *160.00* |
| 18-8 borings, turnings | 70.00-75.00 |
| 410 sheets, clips, solids | 40.00-45.00 |
| 430 sheets, clips, solids | 55.00-60.00 |

### BOSTON

(Brokers' prices; f.o.b. shipping point)

| | |
|---|---|
| No. 1 heavy melting | 28.50-29.00 |
| No. 2 heavy melting | 25.00-26.00 |
| No. 1 bundles | 28.00-29.00 |
| No. 1 busheling | 28.50-29.00 |
| Machine shop turnings | 5.00-6.00 |
| Shovel turnings | 9.00-9.50 |
| No. 1 cast | 39.00-40.00 |
| Mixed cupola cast | 32.00-33.00 |
| No. 1 machinery cast | 40.00-42.00 |

### ST. LOUIS (Brokers' buying prices)

| | |
|---|---|
| *No. 1 heavy melting* | *34.00* |
| *No. 2 heavy melting* | *29.00* |
| No. 1 bundles | 35.00 |
| *No. 2 bundles* | *24.00* |
| No. 1 busheling | 35.00 |
| *Machine shop turnings* | *15.50* |
| *Shovel turnings* | *17.50* |

Cast Iron Grades

| | |
|---|---|
| No. 1 cupola | 36.00 |
| Charging box cast | 34.00 |
| Heavy breakable cast | 32.00 |
| Unstripped motor blocks | 34.00 |
| *Clean auto cast* | *37.00* |
| Stove plate | 31.50 |

Railroad Scrap

| | |
|---|---|
| *No. 1 R.R. heavy melt.* | *37.00* |
| Rails, random lengths | 42.00 |
| Rails, rerolling | 55.00 |
| Rails, 18 in. and under | 45.00 |
| Railroad specialties | 42.00 |
| Angles, splice bars | 40.00† |

### BIRMINGHAM

| | |
|---|---|
| *No. 1 heavy melting* | *38.00-39.00* |
| No. 2 heavy melting | 30.00-31.00 |
| *No. 1 bundles* | *38.00-39.00* |
| No. 2 bundles | 22.00-23.00 |
| No. 1 busheling | 40.00-41.00 |
| Cast iron borings | 10.00-11.00 |
| Machine shop turnings | 18.00-19.00 |
| Shovel turnings | 20.00-21.00 |
| Bar crops and plate | 44.00-45.00 |
| Structurals & plate | 44.00-45.00 |
| Electric furnace bundles | 40.00-41.00 |
| Electric furnace: | |
| *3 ft and under* | *37.00-38.00* |
| 2 ft and under | 39.00-40.00 |

Cast Iron Grades

| | |
|---|---|
| *No. 1 cupola* | *41.00-42.00* |
| *Stove plate* | *41.00-42.00* |
| *Unstripped motor blocks* | *30.00-31.00* |
| No. 1 wheels | 34.00-35.00 |

Railroad Scrap

| | |
|---|---|
| No. 1 R. R. heavy melt. | 39.00-40.00 |
| Rails, rerolling | 51.00-52.00 |
| Rails, 2 ft and under | 46.00-47.00 |
| Rails, random lengths | 42.00-43.00 |
| Angles, splice bars | 43.00-44.00 |

### HOUSTON

| | |
|---|---|
| (Brokers' buying prices; f.o.b. car) | |
| No. 1 heavy melting | 36.00-37.00 |
| No. 2 heavy melting | 33.00-34.00 |
| No. 1 bundles | 38.00-39.00 |
| No. 2 bundles | 24.00-25.00 |
| Machine shop turnings | 12.50-13.00 |
| Crushed turnings | 19.00 |
| Low phos. plate & structurals: | |
| 3 ft | 41.00-42.00 |
| 2 ft and under | 47.00-48.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 cupola | 41.50-42.50 |
| Heavy breakable | 25.00-26.00 |
| Foundry malleable | 29.00-30.00 |
| Unstripped motor blocks | 30.00-31.00 |

Railroad Scrap

| | |
|---|---|
| R. R. heavy melt (3 ft) | 40.00-41.00 |

### LOS ANGELES

| | |
|---|---|
| No. 1 heavy melting | 43.00-45.00 |
| No. 2 heavy melting | 40.00 |
| No. 1 bundles | 42.00 |
| No. 2 bundles | 29.00-30.00 |
| No. 2 bundles (export) | 30.00-31.00 |
| Machine shop turnings | 20.00 |
| Shovel turnings | 20.00 |
| Cast iron borings | 17.00-18.00 |
| Electric furnace scrap | 50.00-52.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 cupola | 46.00-47.00 |

Railroad Scrap

| | |
|---|---|
| No. 1 R.R. heavy melt. | 43.00-45.00 |

### PORTLAND, OREG.

(Prepared, f.o.b. car)

| | |
|---|---|
| No. 1 heavy melting | 49.00 |
| No. 2 heavy melting | 45.00 |
| No. 2 bundles | 35.00 |
| Shovel turnings | 18.00 |
| Electric furnace | 54.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 cupola | 41.00 |
| Heavy breakable | 38.00 |
| Unstripped motor blocks | 38.00 |
| Stove plate (f.o.b. plant) | 37.00 |

### SEATTLE (Prepared, f.o.b. car)

| | |
|---|---|
| No. 1 heavy melting | 49.00 |
| No. 1 hvy (unprepared) | 44.00 |
| No. 2 heavy melting | 45.00 |
| No. 2 hvy (unprepared) | 40.00 |
| No. 2 bundles | 35.00 |
| Shovel turnings | 16.00-18.00 |
| Electric furnace | 52.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 cupola | 41.00 |
| Heavy breakable cast | 38.00 |
| Stove plate (f.o.b. plant) | 36.00 |
| Unstripped motor blocks | 37.00 |

### SAN FRANCISCO

| | |
|---|---|
| No. 1 heavy melting | 43.00** |
| No. 2 heavy melting | 40.00** |
| No. 1 bundles | 34.00** |
| No. 2 bundles | 29.00** |
| Machine shop turnings | 16.00-18.00 |
| Mixed borings, turnings | 16.00-18.00 |
| Cast iron borings | 16.00-18.00 |
| Heavy turnings | 16.00-18.00 |
| Shovel turnings | 16.00-18.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 cupola | 47.00 |
| Charging box cast | 34.00 |
| Stove plate | 34.00 |
| Heavy breakable cast | 28.00 |
| Unstripped motor blocks | 31.00 |
| Clean auto cast | 40.00 |
| Drop broken machinery | 45.00-46.00 |
| No. 1 wheels | 34.00 |

### HAMILTON, ONT.

| | |
|---|---|
| (Brokers' buying prices; net tons) | |
| No. 1 heavy melting | 30.00 |
| No. 2 hvy melt, 2 ft & under | 29.00 |
| No. 1 bundles | 31.00 |
| No. 2 bundles | 23.50 |
| Mixed steel scrap | 22.00 |
| Mixed borings, turnings | 12.00 |
| Busheling, new factory: | |
| Prepared | 30.00 |
| Unprepared | 24.00 |
| Shovel turnings | 12.00 |

Cast Iron Grades‡

| | |
|---|---|
| No. 1 machinery cast | 32.00 |

---

**Based mainly on export sales.

†Nominal.

‡F.o.b. Hamilton, Ont.

§Delivered.

Don't blindfold him!

THE MAN in this picture is a cancer research scientist. The device he is using looks like something out of science fiction—but actually, it's an electron microscope. It shows the sub-microscopic detail of a cancer cell—magnified 100,000 times. *The cost of one electron microscope is $35,000.*

Some of the equipment needed for cancer research is even more expensive.

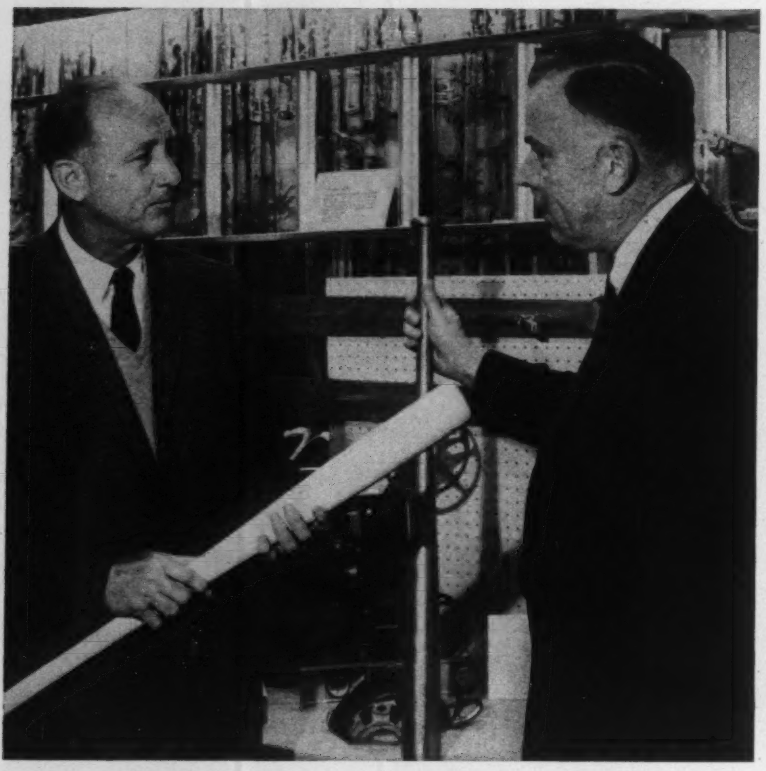
Today, in research centers throughout the country, 1300 scientists, supported by American Cancer Society funds, are at work searching for the cause of cancer—and, ultimately, ways to prevent it.

The American Cancer Society grants millions of dollars for research on such projects as the study of viruses as a possible cause of cancer—the development of hormone treatments for cancer—the control of cancer by drugs. *Life-and-death projects.*

Your help is needed to enable the American Cancer Society to continue this support.

Don't blindfold cancer research. Give to it. Send your contribution now, to CANCER, c/o your local post office. All gifts are tax-deductible.

**AMERICAN CANCER SOCIETY**



## Baseball bats are only one new application as . . .

# Magnesium Industry Swings For New Civilian Markets

THE TWO GENTLEMEN above have one thing in common. They would like to see magnesium chase wood right out of the ball park as the material for the 6 million baseball bats sold in the U. S. annually.

At the left is Dixie Walker, former star for the Brooklyn Dodgers, who represents the company making the magnesium bats. To the right is C. A. Howe, president of the Magnesium Association.

The magnesium bat may or may not catch on. But the point is this: Commercial uses are taking a bigger and bigger chunk of magnesium output. They account for about 70 per cent of sales. The fact was clearly evident at the Magnesium Association's 17th annual convention in New York last week where the industry displayed more than 150 nondefense products.

Of course, the industry is still strongly affected by the whims of military spending. The swing away from manned aircraft has cut sharply into the defense market, despite substantial usage of the metal in the missile and space program.

So the industry is banking on such uses as these: The rotor and stator for the forced air ventilation systems featured in all '62 model Dodges and Plymouths; other older automotive uses like fuel pumps, oil filter bypass valves, transmission stator blades; sporting goods (sleds, skis); camera parts and cases; lawn mower housings and other parts; luggage; stepladders; tooling plates, jigs and fixtures.

- **Space Is a Market**—The missile-satellite market has been growing. Magnesium sheets, forgings, and extrusions are found in the Titan, Talos, Bomarc, Polaris, and Jupiter missiles and the Agena satellite. A recent application is in the storage container and the cab of the tractor used to move the Minuteman.

The spacecraft being designed for a lunar landing, the Rangers 3, 4, and 5, will use magnesium for 86 chassis and subchassis boxes to house electronic gear for guidance control, power, scientific experiments, and computation.

Space uses may get an added boost through a series of alloys (containing 11 per cent or more of lithium) being researched at Battelle Memorial Institute.

- **Potential**—While magnesium has lots of potential, its present markets are small. The industry has yet to capture its first mass tonnage use. Demand over the last few years has been on a plateau.

- **Rebounding in '61**—Magnesium sales slumped in 1960. This year, demand is on the upswing. Most fabricators expect a gain of 10 to 15 per cent in sales. Primary magnesium shipments (including exports) should hit about 56,000 tons compared with 54,000 tons in 1960.

Production of primary magnesium this year will run about 42,000 tons, slightly edging the 1960 total of 40,070 tons. Production has been running under shipments and consumption since 1957. Producer stocks are low now, and a production boost within the next six months is likely.

# FORMBRITE

**SUPERFINE-GRAIN DRAWING BRASS**

## smooth and easy on the draw!

Formbrite . . . an exclusive Anaconda product, is springier, harder, more scratch resistant . . . provides better finish before and *after* forming . . . than the usual drawing brasses in the same standard tempers. It has remarkable ductility for forming and drawing—even such deep-drawn products as pen barrels. Yet it costs no more than ordinary drawing brass, despite its superiority.

When you buy or specify Anaconda American Brass, you can choose from nearly 300 different alloys . . . the greatest range of sizes, shapes, tempers and characteristics in Copper and Copper Metals. Contact your Anaconda representative or write: Anaconda American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ontario. 61-1146

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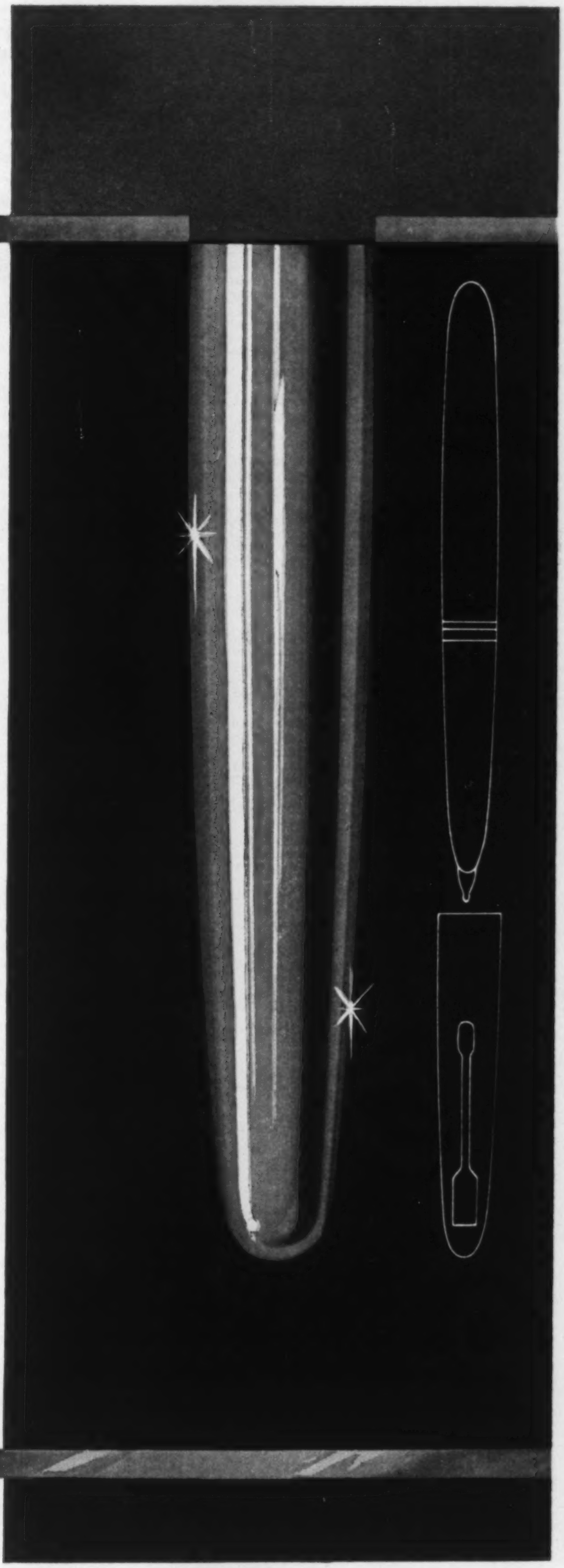

# Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

## PRIMARY METALS AND ALLOYS

**Aluminum:** 99.5%, 30 and 50 lb ingots, 24.00, 30,000 lb or more, f.o.b. customer custody.

**Aluminum Alloy:** No. 13, 25.20; No. 43, 25.30; No. 195, 26.70; No. 214, 28.10; No. 356, 26.00, 30 and 50 lb ingots.

**Antimony:** R.M.M. brand, 95.5%, 32.50; Lone Star brand, 33.00, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 30.50-31.00, New York, duty paid, 10,000 lb or more.

**Beryllium:** 97% lump or beads, $70.00 per lb, f.o.b. Cleveland or Reading, Pa.

**Beryllium Aluminum:** 5% Be, $65 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

**Beryllium Copper:** 3.75-4.75% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

**Bismuth:** $2.25 per lb, ton lots.

**Cadmium:** Sticks and bars, $1.70 per lb deld.

**Cobalt:** 99+%, $1.50 per lb for 500-lb keg; $1.52 per lb for 100 lb case; $1.57 per lb under 100 lb.

**Columbium:** Powder, $40 per lb and up nom.

**Copper:** Electrolytic, 31.00 deld; custom smelters, 31.00 nom; lake, 31.00 deld; fire refined, 30.75.

**Germanium:** Purified, ingots, less than 1 kg 37.50 per gram; 1-10 kg 32.00 per gram; 10 kg or more, 29.95 per gram; intrinsic grade, under 10 kg, 31.95 per gram; 10 kg or more, 29.95 per gram.

**Gold:** U. S. Treasury, $35 per oz.

**Indium:** 99.9%, $2.25 per troy oz.

**Iridium:** $70-75 per troy oz nom.

**Lead:** Common, 10.80; chemical, 10.90; corroding, 10.90; St. Louis, New York basis, add 0.20.

**Lithium:** 1 lb or 2 lb ingots, less than 24 lb, $11 per lb deld; 24-99 lb, $9.50; 100-449 lb, $9.25; 450 lb or more, $9 per lb, delivered.

**Magnesium:** Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex., 1.3 in. diam. x 12 in. sticks, 57.00 f.o.b. Madison, Ill.

**Magnesium Alloy:** AZ91A (diecasting), 40.75; AZ63A, AZ92A, AZ91C (sand casting), 40.75 f.o.b. Velasco, Tex.

**Mercury:** Open market, spot, New York, $188-191 per 76 lb flask.

**Molybdenum:** Unalloyed forging billets, 4.125-8.5 in. diam., 50-4999 lb, $8.15 per lb, depending on quantity; 5000 lb or more, $8 per lb, f.o.b. Coldwater, Mich.

**Nickel:** Electrolytic cathodes, briquettes, sheets (4 x 4 in. and larger), unpacked, 81.25; 10-lb pig, unpacked, 89.00; "XX" nickel shot, 88.75; "F" nickel shot for addition to cast iron, in kegs, 81.75; "F" nickel, 5 lb ingots, 82.75. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.09. Nickel oxide sinter at Buffalo, New York, or other established U. S. ports of entry, contained nickel, 77.50.

**Osmium:** $70-90 per troy oz nom.

**Palladium:** $24-26 per troy oz.

**Platinum:** $82-85 per troy oz from refineries.

**Radium:** $16-21.50 per mg radium content, depending on quantity.

**Rhodium:** $137-140 per troy oz.

**Ruthenium:** $55-60 per troy oz.

**Selenium:** $6.50 per lb, commercial grade.

**Silver:** Open market, 91.375 per troy oz.

**Sodium:** Solid pack, c.l., 19.50; l.c.l., 20.00; 5 and 12 lb bricks, c.l., 21.00; l.c.l., 21.50; tank car, 17.00.

**Tantalum:** Melting stock, $35 per lb; rod, $60 per lb nom; sheet, $55 per lb nom.

**Tellurium:** $5.25 per lb, 100 lb or more.

**Thallium:** $7.50 per lb.

**Tin:** Straits, N. Y., spot and prompt, 120.375.

**Titanium:** Sponge, 99.3+% grade A-1, ductile (0.3% Fe max), $1.37 per lb; grade A-2 (0.5% Fe max), $1.50 per lb.

**Tungsten:** Powder, 98.8%, carbon reduced, 100-lb lots, $2.75 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00c; 99+% hydrogen reduced, $3.25.

**Zinc:** Prime Western, 11.50; brass special 11.70; intermediate, 11.70, East St. Louis, freight allowed over 0.50 per lb, New York basis, add 0.50. High grade, 12.35; special high grade, 12.50 deld. Diecasting alloy ingot No. 3, 13.75; No. 2, 14.25; No. 5, 14.00 deld.

**Zirconium:** Reactor grade sponge, 100 lb or less, $7.25-7.75 per lb; 100-500 lb, $6.75-7.25 per lb; 500-1000 lb, $6.25-6.75; over 1000 lb, $6.25 per lb.

(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

## SECONDARY METALS AND ALLOYS

**Aluminum Ingot:** Piston alloys, 24.00; No. 12 foundry alloy (No. 2 grade), 21.25; 5% silicon alloy, 0.60 Cu max, 23.00; 13 alloy, 0.60 Cu max, 23.00; 195 alloy, 24.25; 108 alloy, 21.75. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 22.75; grade 2, 21.50; grade 3, 20.50; grade 4, 19.50.

**Brass Ingot:** Red brass, No. 115, 32.00; tin bronze, No. 225, 41.25; No. 245, 35.75; high leaded tin bronze, No. 305, 36.00; No. 1 yellow, No. 405, 27.50; manganese bronze, No. 421, 31.25.

**Magnesium Alloy Ingot:** AZ63A, 37.50; AZ91B, 37.25; AZ91C, 41.25; AZ92A, 37.50.

## NONFERROUS PRODUCTS

### BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.98, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1 98, f.o.b. Temple, Pa.

### COPPER WIRE

Bare, soft, f.o.b. eastern mills, 20,000-lb lots, 36.35; l.c.l., 36.98. Weatherproof 20,000-lb lots, 37.05; l.c.l., 37.80.

### LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $16.50 per cwt; pipe, full coils, $16.50 per cwt; traps and bends, list prices plus 30%.

### TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheets and strip, $5.70-15.50; sheared mill plate, $4.45-9.00; wire, $5.00-9.50; forging billets, $3.00-4.75; hot-rolled and forged bars, $3.39-6.25.

### ZINC

(Prices per lb, c.l., f.o.b. mill.) Sheets, 28.00; ribbon zinc in coils, 22.50; plates, 21.50.

### ZIRCONIUM

Plate, $11.00-16.00; H.R. strip, $11.00-15.00; C.R. strip, $13.00-18.00; forged or H.R. bars, $11.00-15.00.

### NICKEL, MONEL, INCONEL

| | "A" Nickel | Monel | Inconel |
|---|---|---|---|
| Sheets, C.R. ....... | 147 | 126 | 145 |
| Strip, C.R. ........ | 133 | 114 | 145 |
| Plate, H.R. ........ | 134 | 116 | 133 |
| Rod, Shapes, H.R. . | 116 | 95 | 116 |
| Seamless Tubes .... | 157 | 129 | 200 |

### ALUMINUM

(Selected products and sizes)

**Flat Sheets:** 1100, 3003, and 5005, mill finish,

| Thickness Range (in.) | Width (in.) | Length Range (in.) | Price Range |
|---|---|---|---|
| 0.250-0.183 | 24-72 | 72-180 | 44.40-47.00 |
| 0.183-0.154 | 24-72 | 72-180 | 44.40-47.00 |
| 0.154-0.120 | 24-72 | 72-180 | 44.90-47.80 |
| 0.120-0.096 | 24-72 | 72-180 | 44.90-47.80 |
| 0.096-0.076 | 24-72 | 72-180 | 45.40-49.30 |
| 0.076-0.060 | 24-72 | 72-180 | 45.90-50.10 |
| 0.060-0.047 | 24-72 | 72-180 | 46.40-51.30 |
| 0 047-0.037 | 24-72 | 72-180 | 46.90-52.70 |
| 0.037-0.030 | 24-72 | 72-180 | 47.40-54.30 |
| 0.030-0.023 | 24-60 | 72-180 | 47.90-56.10 |
| 0.023-0.018 | 24-48 | 72-144 | 48.40-56.40 |
| 0.018-0.014 | 24-48 | 72-144 | 50.20-57.00 |
| 0.014-0.011 | 24-48 | 72-144 | 52.50-59.00 |
| 0.011-0.0085 | 24-36 | 72-96 | 55.20 |
| 0 0085-0.007 | 24-36 | 72-96 | 58.20 |
| 0.007-0.006 | 24-36 | 72-96 | 61.00 |

### ALUMINUM (continued)

**Plates:** 1100, 3003, and 5005, mill finish, 0, H12, and H14 tempers, 30,000 lb base f.o.b. customer custody.

| Thickness Range (in.) | Width (in.) | Length Range (in.) | Price Range |
|---|---|---|---|
| 3.000-2.000 | 6-144 | 72-240 | 45.10-50.00 |
| 2.000-1.251 | 6-144 | 72-240 | 45.50-50.30 |
| 1.251-0.751 | 6-144 | 72-240 | 44.50-49.60 |
| 0.751-0.250 | 6-144 | 72-240 | 44.50-49.60 |

**Screw Machine Stock:** 30,000 base, 12 ft lengths.

| Diam | ——Round—— | | ——Hexagonal—— | |
|---|---|---|---|---|
| (in.)* | 2011-T3 | 2017-T4 | 2011-T3 | 2017-T4 |
| 0.125 | 74.90 | 76.30 | .... | .... |
| 0.188 | 63.20 | 62.20 | .... | 79.10 |
| 0.250 | 60.00 | 61.60 | 72.70 | 73.10 |
| 0.375 | 59.20 | 62.80 | 71.00 | 71.00 |
| | 2011-T3 | 2017-T451 | 2011-T3 | 2017-T451 |
| 0.500 | 59.20 | 62.80 | 71.00 | 71.00 |
| 0.625 | 59.20 | 62.80 | 67.80 | 66.90 |
| 0.750 | 57.70 | 61.00 | 61.60 | 62.80 |
| 0.875 | 57.70 | 61.00 | 61.60 | 62.80 |
| 1.000 | 57.70 | 61.00 | 61.60 | 62.80 |
| 1.125 | 55.30 | 58.50 | 59.50 | 60.50 |
| 1.375 | 55.30 | 58.50 | 59.50 | 60.50 |
| 1.500 | 55.30 | 58.50 | 59.50 | 60.50 |
| 1.625 | 53.00 | 55.70 | .... | 58.30 |
| 1.750 | 53.00 | 55.70 | 58.30 | 58.30 |
| 1.875 | 53.00 | 55.70 | .... | 58.30 |
| 2.000 | 53.00 | 55.70 | 58.30 | 58.30 |
| 2 250 | 51.50 | 54.00 | .... | 58.30 |
| 2.500 | 51.50 | 54.00 | .... | 58.30 |
| 2.750 | 49.90 | 52.20 | .... | 58.30 |
| 3.000 | 49.00 | 52.20 | .... | 58.30 |
| 3.250 | .... | 52.20 | .... | .... |
| 3.375 | .... | 52.20 | .... | .... |

Selected sizes.

**Forging Stock:** Rounds, Class 1, random length, diam., 0.375-8 in., "F" temper; 2014, 45.50-55.60; 6061, 41.50-55.60; 7075, 56.50-64.60; 7079, 58.50-66.60.

**Pipe:** ASA schedule 40, alloy 6063-T6, 3-40 ft lengths, plain ends, 90,000 lb base, dollars per ft. Nominal pipe sizes: 1 in., 32.00; 1¼ in., 43.40; 1½ in., 51.80; 2 in., 62.60; 3 in., 124.95; 4 in., 171.80; 5 in., 233.15; 6 in., 308.55; 8 in., 464.35; 10 in., 716.25 (3-24 ft lengths).

**Extruded Solid Shapes**

| Factor | Alloy 6063-T5 | Alloy 6062-T6 |
|---|---|---|
| 1-14 | 45.30-46.80 | 54.00-60.00 |
| 15-17 | 45.30-46.80 | 56.50-61.80 |
| 18-23 | 45.80-47.50 | 58.60-67.00 |
| 24-32 | 45.80-47.50 | 66.80-81.50 |
| 33-38 | 49.50-52.20 | 85.10-96.60 |
| 39-44 | 59.80-63.60 | 102.00-124.00 |

### MAGNESIUM

**Sheets and Plates:** AZ31B standard grades, .032 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.00 in., 67.90. AZ31B spec. grades, .032 in., 171.30; .081 in., 108.80; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Tread plate, 60-192 in. lengths, 24.72 in. width: .125 in., 74.90; .188 in., 71.70-72.70; .25-.75 in., 70.60-71.60. Tooling plate, 0.25-3.00 in., 73.00.

**Extruded Solid Shapes:**

| Factor | (AZ31C) Com. Grade | (AZ31B) Spec. Grades |
|---|---|---|
| 6-8 | 65.30-67.60 | 84.60-87.40 |
| 12-14 | 65.30-67.60 | 85.70-88.00 |
| 24-26 | 66.10-68.40 | 90.60-91.30 |
| 36-38 | 71.50-75.30 | 104.20-105.30 |

## NONFERROUS SCRAP

### DEALER'S BUYING PRICES

**Copper and Brass:** No. 1 heavy copper and wire, 23.75-24.25; No. 2 heavy copper and wire, 21.75-22.25; light copper, 19.00-19.50; No. 1 composition red brass, 21.50-22.00; No. 1

## BRASS MILL PRICES

| (Copper or Copper Alloy No.) | MILL PRODUCTS a<br>Sheet, Strip, Plate | Rod | Wire | Seamless Tubes | SCRAP ALLOWANCES d (Based on copper at 31.00c)<br>Clean Heavy | Rod Ends | Clean Turnings |
|---|---|---|---|---|---|---|---|
| Copper (110) .......... | 56.13b | 50.36–51.36 | .... | 57.32 | 27.00 | 27.00 | 26.25 |
| Yellow Brass (268, 270). | 49.27 | 35.77c | 49.56 | 53.43 | 20.375 | 19.50c | 18.50c |
| Low Brass, 80% (240).. | 52.15 | 52.09 | 52.44 | 56.21 | 22.875 | 22.625 | 22.125 |
| Red Brass, 85% (230) .. | 53.17 | 53.11 | 53.46 | 57.23 | 23.875 | 23.625 | 23.125 |
| Com. Bronze, 90% (220) | 54.73 | 54.67 | 55.02 | 58.54 | 24.75 | 24.50 | 24.00 |
| Manganese Bronze (675) | 57.69 | 51.27 | 61.54 | .... | 19.25 | 19.00 | 18.50 |
| Muntz Metal (365) ..... | 51.94 | 47.25 | .... | .... | 19.125 | 18.875 | 18.375 |
| Naval Brass (464) ..... | 53.94 | 47.75 | 60.25 | 58.10 | 19.00 | 18.75 | 18.25 |
| Silicon Bronze (651) .... | 61.39 | 60.58 | 60.68 | 79.80 | 26.50 | 26.25 | 25.75 |
| Nickel Silver, 10% (745) | 65.56 | 67.16 | 66.91 | .... | 26.00 | 25.75 | 13.00 |
| Phos. Bronze, A-5% (510) | 76.97 | 77.47 | 76.72 | 78.90 | 28.50 | 28.25 | 27.25 |

a. Cents per lb, f.o.b. mill; freight allowed on 50 lb or more. b. Hot-rolled. c. Free cutting. d. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time of any or all kinds of scrap, add 1 cent per lb.

composition turnings, 20.50-21.00; new brass clippings, 17.00-17.50; light brass, 14.00-14.50; heavy yellow brass, 15.00-15.50; new brass rod ends, 16.00-16.50; auto radiators, unsweated, 17.50-18.00; cocks and faucets, 18.00-18.50; brass pipe, 17.00-17.50.

**Lead:** Soft scrap lead, 7.25-7.50; battery plates, 3.00-3.25; linotype and stereotype, 8.50-8.75; electrotype, 8.00-8.25; mixed babbitt, 10.00-10.50.

**Monel:** Clippings, 26.00-26.50; old sheets, 25.00-25.50; turnings, 18.50-19.00; rods, 25.00-25.50.

**Nickel:** Sheets and clips, 56.00-58.00; rolled anodes, 56.00-58.00; turnings, 43.00; rod ends, 56.00-58.00.

**Zinc:** Old zinc, 3.00-3.25; new diecast scrap, 3.00-3.50; old diecast scrap, 1.75-2.00.

**Aluminum:** Old castings and sheets, 8.50-9.00; clean borings and turnings, 3.00-3.50; segregated high copper clips, 9.25-9.75; mixed low copper clips, 9.75-10.25; mixed high copper clips, 9.25-9.75.

(Cents per pound, Chicago)

**Aluminum:** Old castings and sheets, 7.00-7.50; clean borings and turnings, 6.00-6.50; segregated low copper clips, 14.00-14.50; segregated high copper clips, 12.50-13.50; mixed low copper clips, 12.00-13.00; mixed high copper clips, 11.00-12.00.

(Cents per pound, Cleveland)

**Aluminum:** Old castings and sheets, 9.75; clean borings and turnings, 8.50; segregated low copper clips, 13.00; segregated high copper clips, 12.25; mixed low copper clips, 12.50; mixed high copper clips, 12.50.

### REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

**Beryllium Copper:** Heavy scrap, 0.020-in. and heavier, not les than 1.5% Be, 57.00; light scrap, 52.00; turnings and borings, 37.00.

**Copper and Brass:** No. 1 heavy copper and wire, 27.25; No. 2 heavy copper and wire, 25.25; light copper, 23.00; refinery brass (60% copper) dry copper content, 24.00.

### INGOTMAKERS' BUYING PRICES

**Copper and Brass:** No. 1 heavy copper and wire, 27.25; No. 2 heavy copper and wire, 25.25; light copper, 23.00; No. 1 composition borings, 24.00; No. 1 composition solids, 24.50; heavy yellow brass solids, 18.00; yellow brass turnings, 16.50; radiators, 20.00.

## Plating Material

(F.o.b. shipping point, freight allowed on quantities)

### ANODES

**Cadmium:** Special or patented shapes, $1.60.

**Copper:** Flat-rolled, 47.50; oval, 44.50; electrodeposited, 37.50; cast, 42.50, 5000-10,000 lb quantities.

**Nickel:** Depolarized, less than 500 lb, 117.50; 500-1999 lb, 110.50; 2000-4999 lb, 107.00; 5000-29,999 lb, 106.00; 30,000 lb, 105.00. Carbonized, deduct 3 cents a lb.

**Tin:** Bar or slab, less than 200 lb, 137.50; 200-499 lb, 137.00; 500-999 lb, 136.50; 1000 lb or more, 136.00.

**Zinc:** Balls, 18.25; flat tops, 18.25; flats, 21.00; ovals, 20.85, ton lots.

### CHEMICALS

**Cadmium Oxide:** $1.60 per lb in 100-lb drums.

**Chrome Acid (flake):** 100-2000 lb, 31.00; 2000-10,000 lb, 30.50; 10,000-20,000 lb, 30.00; 20,000 lb or more, 29.50.

**Copper Cyanide:** 100-200 lb, 65.90; 300-900 lb, 63.00; 1000-19,000 lb, 61.90.

**Copper Sulphate:** 100-1900 lb, 15.50; 2000-5900 lb, 13.50; 6000-11,900 lb, 13.25; 12,000-22,900 lb, 13.00; 23,000 lb or more, 12.50.

**Nickel-Chloride:** 100 lb, 47.50; 200 lb, 45.50; 300 lb, 44.50; 400-4900 lb, 42.50; 500-9900 lb, 40.50; 10,000 lb or more, 39.50.

**Nickel Sulphate:** 5000-22,999 lb, 31.00; 23,000-39,900 lb, 30.50; 40,000 lb or more, 30.00.

**Sodium Cyanide (Cyanobrik):** 200 lb, 23.80; 400-900 lb, 20.80; 1000-4900 lb, 19.80; 5000-19,900 lb, 18.80; 20,000 lb or more, 17.60.

**Sodium Stannate:** Less than 100 lb, 88.30; 100-600 lb, 78.60; 700-1900 lb, 75.90; 2000-9990 lb, 74.00; 10,000 lb or more, 72.70.

**Stannous Chloride (Anhydrous):** 100 lb, 147.20; 400 lb, 137.20; 800-19,000 lb, 115.90; 20,000 lb or more, 111.70.

**Stannous Sulphate:** Less than 50 lb, 154.50; 50 lb, 124.50; 100-1900 lb, 122.50; 2000 lb or more, 120.50.

**Zinc Cyanide:** 100-200 lb, 59.00; 300-900 lb, 57.00.

*(Concluded from Page 119)*

increase over the 7,614,000 held on July 31. Stocks of pig iron were slightly lower, 2,710,000 tons vs. 2,736,000.

Home scrap produced in August accounted for 3,090,000 tons, 15 per cent more than during July. Purchased scrap received by consumers totaled 1,915,000 tons, 10 per cent more than during the preceding month.

## Structural Shapes . . .

**Structural Shape Prices, Page 108**

Seasonal slackening in structural activity is noted, but volume continues fairly heavy. Public work continues to dominate, but substantial tonnage is going into diversified construction, including commercial and industrial structures. Labor trouble is hampering construction activities at some Midwest points, notably in the Cleveland area.

Prices for fabricated structurals are weak, largely due to sharp competition for contracts. An increase in the price of structurals would be difficult to maintain, it's said. Fabricating shops are operating on subnormal margins.

Contracts totaling $20,383,000 have been let for the construction of a Mississippi River bridge south of Donaldsonville, La. Morrison-Knudsen Co. Inc. has the contract for the substructure, while American Bridge Div., U. S. Steel, has the superstructure on its low bid of $12.9 million.

## STRUCTURAL SHAPES . . .

### STRUCTURAL STEEL PLACED

4000 tons, steam electric general contractor, unit 4, Indiana & Michigan Electric Co., Lawrenceburg, Ind., to Whitehead & Kales Co., Detroit.

2000 tons, warehouse, Western Electric Co., King of Prussia, Pa., to Belmont Iron Works, Eddystone, Pa.

1080 tons, five state highway bridges, Proj. U-272 (53) Route 128, Lexington, Mass., to West End Iron Works, Cambridge, Mass.; Berke-Moore Inc., Boston, general contractor.

960 tons, mill building, Carpenter Steel Co., Reading, Pa., to Mayer-Pollock, Pottstown, Pa.

500 tons, building, Albert Pipe Supply Co., 123-133 Verick Ave., Brooklyn, N. Y., to a local fabricator.

150 tons, one, three span and one, two span, wide flange beam bridges, Proj. F-020-2(8), U. S. Route 4, Bridgewater, Vt., to City Iron Works Inc., Hartford, Conn.; Miller Construction Co., Windsor, Vt., general contractor; 70 tons, concrete reinforcing bars to Truscon Steel Div., Boston, Republic Steel Corp.

100 tons, addition, Northwest Glass Co., Seattle, to Leckenby Structural Steel Co., Seattle; General Construction Co., Seattle, general contractor.

Unstated, addition to plant of Skagit Steel & Iron Works, Sedro-Woolley, Wash.

## CLASSIFIED

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**Metalworking Plants**
for immediate occupancy
in Wilmington, Del.

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Water frontage with docking facilities. Heavy crane equipment.
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### Help Wanted

**FERROUS METALLURGIST**

Company engaged in extractive and pyrometallurgy requires well qualified graduate metallurgist for production, development and quality control who has experience in one or more of the following: smelting and refining, steel making, or electric furnace operation. Excellent opportunities for qualified man. Hospitalization, insurance, profit sharing and pension plan provided cost free by company. Opening at Kentucky plant. All replies held strictly confidential. Submit detailed resume, including educational and employment backgrounds, as well as salary requirements to Box 967, STEEL, Penton Bldg., Cleveland 13, Ohio.

**WANTED — ASSISTANT SUPERINTENDENT** blast furnace operation. Young well established completely integrated steel company located in great southwest area needs to fill key position in its blast furnace department with well qualified man age limit 45 years. Company currently engaged in multi-million dollar expansion program. Excellent opportunity. Submit complete resume giving personal history, education, experience and salary requirements. All replies held confidential. Box 961, STEEL, Penton Bldg., Cleveland 13, Ohio.

**CHIEF**
**MANUFACTURING ENGINEER**

Graduate M.E. or equivalent w/extensive job shop, plant management experience in tool and die, stamping, plating. Salary commensurate with qualifications. Location East Tennessee. Real Opportunity for energetic, alert, flexible, growing team man. State education, experience, salary requirements and goals, picture to: Box 968, STEEL, Penton Bldg., Cleveland 13, Ohio.

### Positions Wanted

Plant Supervision, excellent background in boiler, pressure vessel and weldment fabrication. Experience includes nonferrous metals. Write Box 970, STEEL, Penton Bldg., Cleveland 13, Ohio.

**WE CAN HELP YOU TO CONTACT** high calibre men to fill specific jobs you have in mind.

Readers of STEEL include men of wide training and experience in the various branches of the metalworking industry. When you have an opportunity to offer, use the Help Wanted columns of STEEL.

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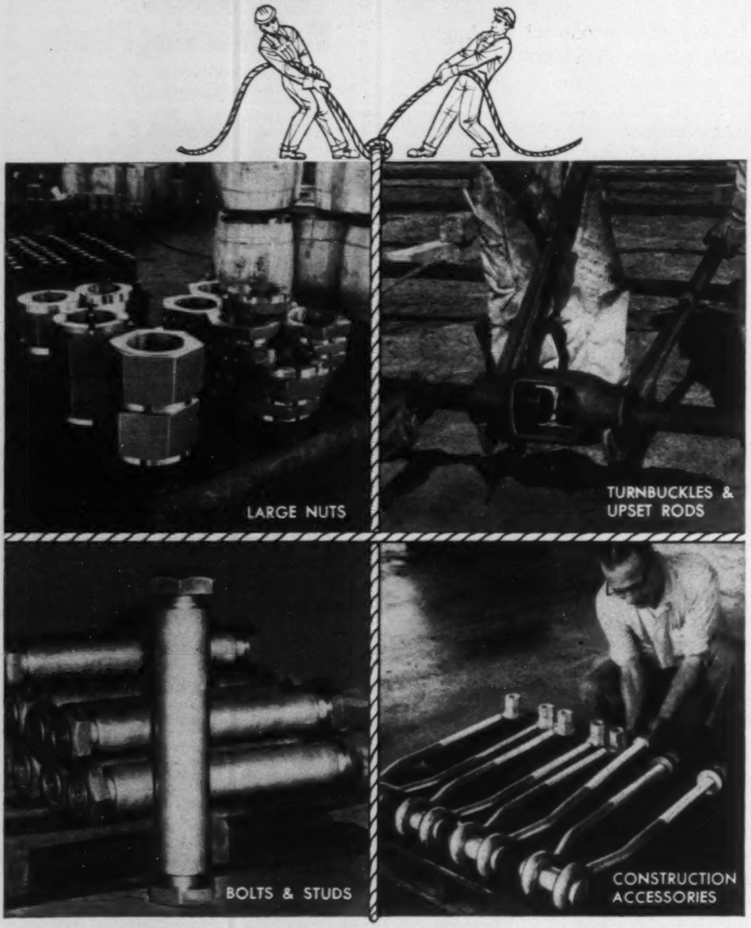

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DYSON

STRUCTURAL STEEL PENDING

8385 tons, state bridgework, FAVWE 61-3, Queens County, New York, Johnson, Drake & Piper, New York, low on the general contract.

5100 tons, Staten Island approach, Verrazano-Narrows Bridge, Triborough Bridge & Tunnel Authority, New York; bids Oct. 31.

4000 tons, state bridgework, FIWE 61-2, Queens County, New York; bids Oct. 26.

3000 tons, building 8-8A, State Department of Public Works, Albany, N. Y.; bids asked.

3000 tons, 25 story office building, 757 Third Ave., New York, Diesel Construction Co., owner and builder.

2771 tons, state bridgework, FAVWE 61-4, Queens County, New York; bids Oct. 26.

2500 tons, post office, Buffalo; pending.

2490 tons, state bridgework, PSC 10324, Nassau County, New York, Hendruckson Bros. Inc., Merrick, N. Y., low on the general contract.

2440 tons, state bridgework, FAGCP 61-5, Queens County, New York; bids Oct. 26.

2000 tons, 21 story Furniture Mart, Lexington and 33rd St., New York; John Campagne, owner and builder.

1648 tons, state bridgework, FAGCP 61-6, Queens County, New York; bids Oct. 26.

1565 tons, transmission towers, Trinity River Div., Central Valley Project, Shasta County, Calif.; bids Nov. 2, Bureau of Reclamation, Lewiston, Calif.

1565 tons, dam, Allegheny County, Pennsylvania; Hunkin Conkey Construction Co., Cleveland, low bidder on the general contract.

1250 tons, addition, Hoffman-LaRoche Inc., Nutley, N. J.; Wigton-Abbott Corp., Jersey City, N. J., engineer.

1200 tons, state bridgework, FISH 61-15, Monroe County, New York; bids Oct. 26.

1125 tons, state bridgework, FIWE 61-1, Queens County, New York; Tully & DiNapoli, New York, low on the general contract.

905 tons, state bridgework, FISCH 61-20, Saratoga County, New York; bids Oct. 26.

785 tons, with prestressed alternate, state bridgework, Proj. LR 799, Sec. 2, Franklin County, Pennsylvania; Bero Construction Corp., Waterloo, N. Y., is low on the general contract.

757 tons, state bridgework, FAGCP 61-4, Queens County, New York; DeLillo Construction Co. Inc., New York, low on the general contract.

673 tons, truss span bridge, Mississippi River, Minneapolis; bids Nov. 6, Northern Pacific Railroad, St. Paul, Minn.

660 tons, prestressed concrete alternate on part, state bridgework, LR 796, Sec. 2, Monroe County, Pennsylvania; James D. Morrissey, Philadelphia, low on the general contract.

627 tons, state bridgework, LR 55, Sec. 8-15½, Huntingdon - Blair counties, Pennsylvania; New Enterprise Stone & Lime Co., New Enterprise, Pa., low on the general contract.

653 tons, state bridgework, FAGCP 61-3, Queens County, New York; Tully & DiNapoli, New York, low on the general contract.

598 tons, state bridgework, FARC 61-132, Sullivan County, New York; bids Oct. 26.

550 tons, Pier No. 94, Cunard Line, New York; bids Oct. 23.

538 tons, railroad bridge in connection with Barkley Dam project, Kentucky; bids Nov. 1, Illinois Central Railroad, Chicago; also, 374 tons of concrete bars.

453 tons, state bridgework, FIC 61-19, Monroe County, New York; bids soon.

450 tons, state bridgework, FASS 61-10, Erie County, New York; Bates & Rogers, Chicago, low on the general contract.

## REINFORCING BARS . . .

### REINFORCING BARS PLACED

475 tons, five state highway bridges, Route 128, Lexington, Mass., to U. S. Steel Supply Div., Boston, U. S. Steel Corp.; Berke-Moore Inc., Boston, general contractor.

240 tons, Montana State bridge, Missoula, Mont., to Pacific Coast Div., Seattle, Bethlehem Steel Co.; Sletten Construction Co., Great Falls, Mont., general contractor.

206 tons, Washington State, two highway spans, King County, to Pacific Coast Div., Seattle, Bethlehem Steel Co.; Snitely Bros. Construction Co., Wenatchee, Wash., general contractor at $251,899.

115 tons, metal and restaurant, Pier 67, Seattle, to Pacific Coast Div., Seattle, Bethlehem Steel Co.

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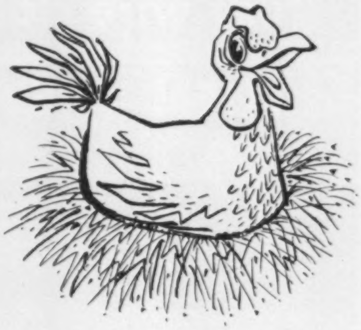

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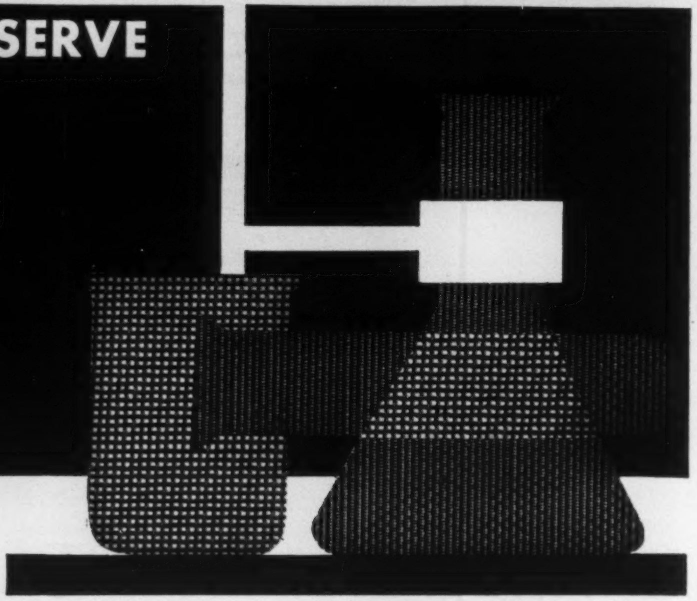
## THEN THEY DESERVE

# Cambridge

## WIRE CLOTH QUALITY & SERVICE



### What is Cambridge Quality?

Wire that consistently meets metal or alloy analyses. Trained operators and modern looms to produce cloth from any metal or alloy in any weave. Constant inspection to assure high accuracy in mesh count and mesh size. Craftsmen to make fabrications in any size, shape or quantity to exacting specifications.

This is Cambridge Wire Cloth Quality.

### What is Cambridge Service?

Prompt answers to mail or phone inquiries. Experienced Field Engineers—experts in their field—who can help you select the wire cloth to do the best job at lowest cost. Prompt deliveries. Large stocks of frequently used cloth for immediate shipment. Follow-up service to see that our product is giving you the results you want.

This is Cambridge Wire Cloth Service.

**Your Cambridge Field Engineer can show you how Cambridge quality and service can help you in your operation. Call him at any time. He's listed in the Yellow Pages under "Wire Cloth". Or, write direct for illustrated 120-page catalog.**

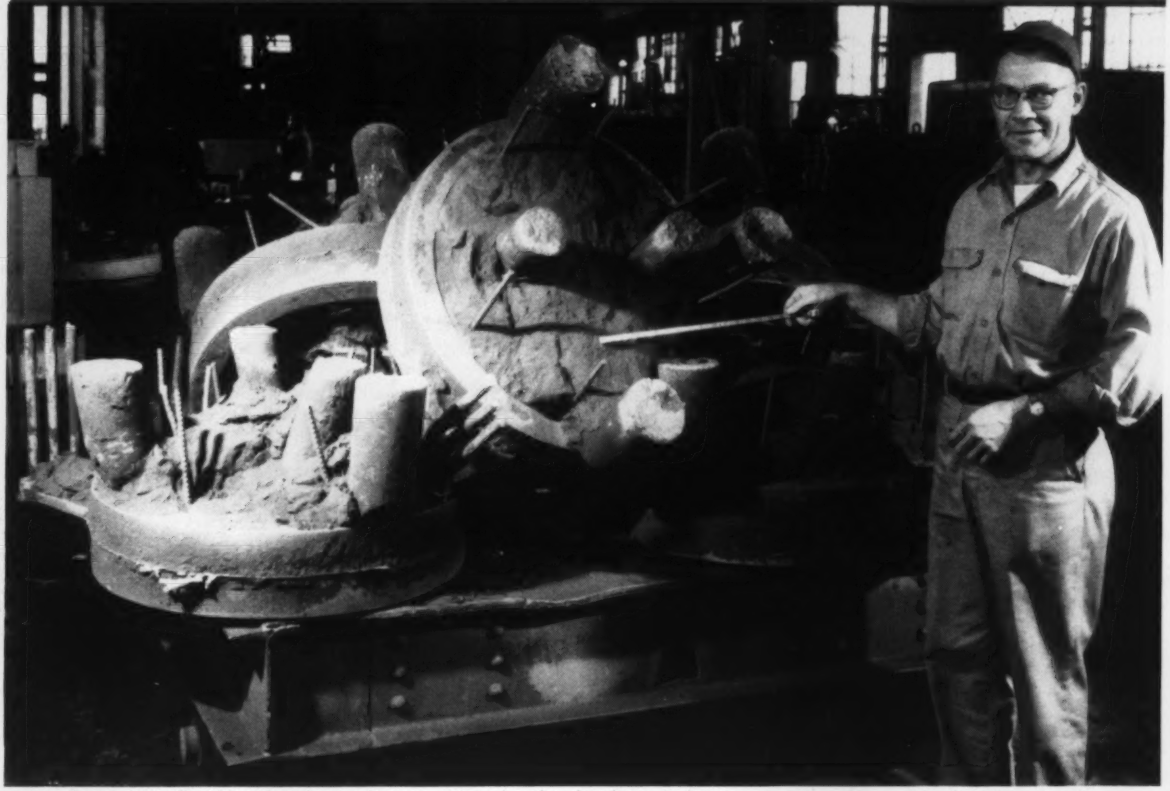
**Refer to our technical data sheet in CHEMICAL ENGINEERING CATALOG, Page 185.**

**The Cambridge Wire Cloth Co.**

Department J • Cambridge 10, Maryland

*Manufacturers of Metal-Mesh Conveyor Belts, Flat Wire Conveyor Belts, Wire Cloth, Wire Cloth Fabrications and Gripper ® Metal-Mesh Slings.*

# New ROTOBLAST saves labor cost of seven men



Cost-cutting Rotoblast knocks out heavy core sand and rods, above, in large castings at Elyria Foundry. Inset: cleaned castings are moved to next operation while second table-load is being Rotoblasted.

One man and one new ROTOBLAST twin table room do the same amount of blast cleaning work *better* than eight men did with previous blast equipment at Elyria Foundry Division, Chromalloy Corporation, Elyria, Ohio. Among extra benefits: new high capacity abrasive separation (equipment on core-knockout ROTOBLASTS) handles core removal right along with blast cleaning, removing a ton of sand an hour from spent abrasive.

Whatever your cleaning needs, a standard or specially designed Rotoblast unit can cut your manpower and operating costs. Full automation can be built in. Easy installation, simple maintenance and fast, thorough cleaning are regular features of Rotoblast.

## TRY ROTOBLAST ABRASIVES, TOO!

You can clean castings faster — at lower cost per ton — with solid, tough Rotoblast Steel Shot and Grit. No wonder! The development of this modern abrasive by Pangborn is based on nearly 60 years' experience supplying industry's blast cleaning needs. We'll be glad to go into more detail. Just write:

PANGBORN CORPORATION, 1600 Pangborn Blvd., Hagerstown, Md.; Pangborn Canada, Ltd., 47 Shaft Rd., Toronto (Rexdale), Canada; or phone district office in Yellow Pages under "Sand Blast Equipment." *Manufacturers of Blast Cleaning, Vibratory Finishing, Dust and Fume Control Equipment — Rotoblast® Steel Shot and Grit®.*

**Operation ROTOBLASTING**

**(BEST IN BLAST CLEANING)**

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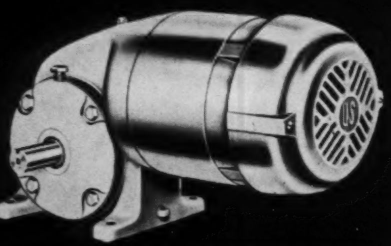
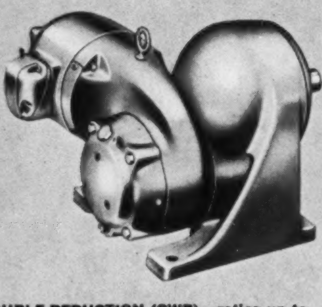
# COMPACT, LOW-SPEED POWER...

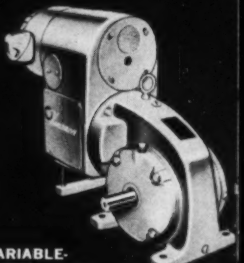


**TOTALLY ENCLOSED**—for corrosive dust, salt, spray and other damaging environments—provides slow speeds for applications in which ordinary motors require frequent replacement.

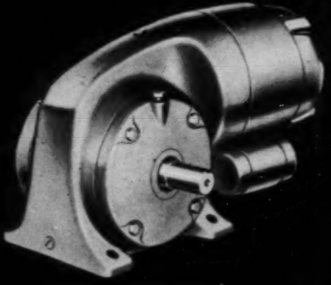
**EXPLOSION-PROOF**—for volatile fume, explosive dust atmospheres—provides genuine explosion-proof characteristics for hazardous environments. Underwriters' Laboratories approved for Class 1 Group D and Class 2 Groups F and G.



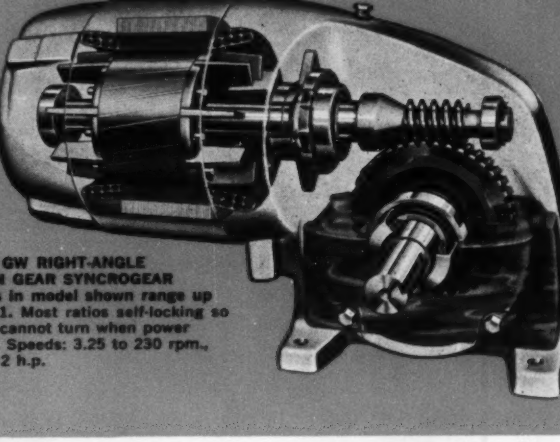
**DOUBLE-REDUCTION (GWB)**—ratios up to 354:1—with second stage helical gear train—provides steady, multiplied torque and extremely slow speeds for applications in which power-speed precision is important. High-torque case is constructed to resist extra pull.



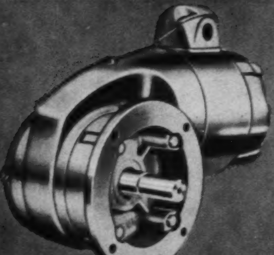
**VARIABLE-SPEED**—makes instant speed changes by merely turning dial—Combination of GW Syncrogear with U.S. Varidrive Motor to provide speed control with worm-gear reduction.



**SINGLE PHASE (GWR)**—can be connected to any 110 or 220 volt line—equipped with capacitor. Single phase is available from ⅓ to 1½ h.p. Single phase is also available in double-reduction. Type GWB-R.



**TYPE GW RIGHT-ANGLE WORM GEAR SYNCROGEAR**
Ratios in model shown range up to 87:1. Most ratios self-locking so shaft cannot turn when power is off. Speeds: 3.25 to 230 rpm., ⅓ to 2 h.p.



**FLANGE-MOUNTED (GWV)**—for direct connection to driven machine—Footless. Can be direct-connected vertically or on side with shaft right or left.

## U. S. SYNCROGEAR/right-angle, worm-gear type

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